

St. Kitts and Nevis: ICT Assessment

17-22 March 2002



FINAL: Version 2.0

St. Kitts and Nevis: ICT Assessment

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Abbreviations and Acronyms

ACS	Association of Caribbean States
ADL	Alexandria Digital Library
ASP	Application Service Provider
C&W	Cable & Wireless
CAGR	Compound Annual Growth Rate
CANA	Caribbean News Agency
CANTO	Caribbean Association of National Telecommunications Organizations
CARICOM	Caribbean Community and Common Market
CDB	Caribbean Development Bank
CET	Common External Tariffs (CARICOM)
CFB	Clarence Fitzroy Bryant College
CIC	Community Information Center
CLAA	Caribbean Latin American Action
CPTM	Commonwealth Partnership for Technology Management
CSP	Council of Social Partners
CXC	Caribbean Examination Council
DOC	U.S. Department of Commerce
DOT Force	Digital Opportunity Task Force
DSL	Digital Subscriber Line
EC\$	Eastern Caribbean Dollar
ECCB	Eastern Caribbean Central Bank
EC-ICT	Eastern Caribbean Information Communications Technology Initiative
ECLAC	United Nation's Economic Commission for Latin America and the Caribbean
ECTEL	Eastern Caribbean Telecommunications Regulatory Authority (St. Lucia, Grenada, St. Kitts/Nevis, St. Lucia, St. Vincent/Grenadines)
EDI	Electronic Data Interchange

EU	European Union
FDI	Foreign Direct Investment
FATF	OECD Financial Action Task Force on Money Laundering
FND	Fund for National Development
FTAA	Free Trade Area of the Americas
G-8	The Group of Eight
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GNP	Gross National Product
HFC	Hybrid Fiber Coaxial
IBC	International Business Company
ICT	Information and Communication Technology
IDB	Inter-American Development Bank
IFC	International Financial Centers
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
IT	Information Technology
ITU	International Telecommunications Union (UN)
kbps	Kilobits per second
Km	Kilometers
LAN	Local Area Network
Mbps	Megabits per second
MHz	Mega (million) Hertz (cycles/second)
MOC	Ministry of Commerce
MOP	Ministry of Planning, Development, Environment & Housing
NDC	National Development Corporation
NGO	Non-Government Organization
NITTF	National Information Technology Training Fund
NTRC	National Telecommunications Regulatory Commission
OECD	Organization for Economic Cooperation & Development
OECS	Organization of Eastern Caribbean States

OPSR	Office of Private Sector Relations
PC	Personal Computer
PPP	Purchasing Power Parity
PPS	Payment Processing Systems (online)
PSTN	Public Switched Telephone Network
RAEP	Rural Adult Education Program
SKN	St. Kitts and Nevis
SKNDB	St. Kitts and Nevis Development Bank
SME	Small and Medium-Sized Enterprise
SEDP	Small Enterprise Development Project
SEDU	Small Enterprise Development Unit
SKN	St. Kitts and Nevis
TA	Technical Assistance
TCP/IP	Transport Connection Protocol/Internet Protocol
U.K.	United Kingdom
UNCTAD	United Nations Commission on Trade and Development
UNDP	United Nations Development Program
UPS	Uninterruptible Power Supply
U.S.	United States
USAID	U.S. Agency for International Development
UWI	University of the West Indies
VAT	Value Added Tax
VOIP	Voice Over Internet Protocol
VSAT	Very Small Aperture Terminal
WB	World Bank
W.I.	West Indies
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

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Management Summary

This Information & Communication Technology (ICT) Assessment was undertaken by Carana Corporation in close coordination with, and in support of, the Organization for Eastern Caribbean States (OECS) and the Eastern Caribbean Telecommunications Regulatory Authority (ECTEL). This work was performed under contract with the U.S. Agency for International Development (USAID) as part of its Eastern Caribbean Information Communications Technology (EC-ICT) initiative.

This Report serves as Phase I of a two-phase effort being coordinated by OECS. Phase II of this effort is being launched in March of 2002 and is being carried out by GOPA (under contract with the World Bank). Whereas this first phase is aimed at compiling and assessing ICT-related information for input and recommendations, GOPA's activities are aimed at developing regional policies and strategies based on this, as well as other, input to their initiative. This Phase I will also put forward to USAID considerations for possible future development initiatives as part of their Caribbean Regional Program (CRP).

The ICT Assessment was built around four key areas: (1) **Public Sector**—an examination of the St. Kitts and Nevis (SKN) Government's use of ICTs and its ICT policy and supporting legal/regulatory framework, (2) **Pipes**—an examination of the current state of telecommunications infrastructure, (3) **Private Sector**—an assessment of the current state of the ICT industry sector and the private sector's use of ICTs, with a focus on growth opportunities, and (4) **People**—a review of the supporting educational systems within the country.

This ICT Assessment found that St. Kitts and Nevis (SKN) has adopted many of the necessary policies to transform its economy, and, on the whole, is headed in the right direction. The Assessment defines a number of key opportunities where targeted initiatives can be undertaken that would benefit SKN in each of the four areas. In summary, these are:

- **Public Sector**—In conjunction with the four other ECTEL countries, St. Kitts and Nevis (SKN) is implementing telecommunications liberalization. SKN had begun encouraging competition in the provision of services and Internet access even before the official April 1, 2002, liberalization date. The Cable, a partly Government-owned cable television provider, has been encouraged to provide high-speed Internet access and other data services to the business market. As the new fixed wire provider, it will also be able to provide voice service to its subscribers, who include 98 percent of the island's households. With the introduction of competition into the telecommunications sector, a period of market turmoil and change has commenced. Vigorous, swift implementation of the new Telecom Act is essential to ensure that the public – business and residential – benefits over the long-term from market liberalization. There is a need to provide technical assistance to assist the National Telecommunications Regulatory Commission's (NTRC) implementation of the Telecommunications Act. The NTRC is likely be handicapped by its small staff and limited resources – two staff and five commissioners –

and faces the prospect of being overwhelmed by legal disputes and the incumbent's (Cable & Wireless) resources. By necessity, it will rely on ECTEL to help screen applicants for licenses and resolve competitive disputes.

In other areas, the Government has created the basis of a comprehensive ICT strategy which pulls together plans for increasing the use of ICTs in the economy. Increased emphasis is being placed on e-government services, and resources are being expended to determine how to place information and transactional services online.

- **Pipes**—Both the incumbent telephone company, Cable & Wireless (C&W), and the fixed wire competitor, The Cable, have invested in new fiber facilities and anticipate new services and pricing options in the future. International communications services for both data and voice are monopoly services controlled by C&W, whose prices are extremely high. Lower prices are likely only with effective competition in the international market. In addition to lower prices, even C&W concedes that improvements are needed in network reliability, service quality, and customer service. More competitive pricing is essential for economic growth and business use of ICTs. Indeed, it was excessive international charges that led some companies to make cheaper, less satisfactory business arrangements.
- **Private Sector**—The private sector's use of ICTs is hampered by high telecommunications costs and a lack of trained personnel. This cost issue will, in part, be addressed by the liberalization of the telecom market and its implementation – a process that has already commenced. However, there is a need to assist St. Kitt's small and medium-sized enterprises (SMEs) in (1) leveraging ICTs beyond their internal administrative and "back office" processes and into their core business processes, and (2) promoting ICT-based businesses themselves. This latter task is being addressed with the assistance of Government development institutions. The need for more robust online marketing can be addressed in part by the establishment of a national or regional Internet portal, preferably developed in conjunction with the SKN Government and business community and other OECS countries. A broadly-based portal can improve online marketing of SKN (and the region) and establish an Internet presence that the country does not have. Opportunities also exist to attract additional foreign direct investment (FDI) in ICT-based businesses.
- **People**—The population of SKN is highly literate in English. The Government is pushing the educational system to increase basic computer literacy and Internet skills, as well as to create a group of technicians able to service basic needs, especially in networking. All school computer labs are wired as well as the lab at the community college. Distance learning has great potential in St Kitt's and Nevis, but current telecom costs are prohibitive and there is, as yet, no national strategy as to what the country wishes to accomplish through online-based distance learning. While a liberalized telecom environment will lower the costs, the bigger issue is the absence of an ICT-related education strategy. In the short-term, the Government is seeking to attract technically-skilled expatriates to help satisfy the demand for qualified IT staff.

The ICT Assessment report has found some ICT areas that warrant high priority attention from the SKN Government and private sector. Some of these issues are technical in nature such as need for experts in network security, where threats to networks are increasing daily. Other areas requiring more focused attention are social and legal in nature such as the country's lag in reforming its laws to accommodate the growing volume of e-commerce. The main body of the ICT Assessment report puts forward recommendations for consideration by OECS. These are constructed to provide direct input into the Phase II initiative being undertaken by GOPA. In addition, a separate set of recommendations has been developed for consideration by USAID. These are preliminary and are published under a separate cover, as their value is for USAID's internal use only and are not available to the general public.

The ICT Assessment Team was comprised of Kevin Hartmann of the Kenan Institute Washington and Eric Lee, head of Lee and Associates. The Team thanks Mr. Burchell Crooke of the SKN Telecoms Ministry for his assistance in scheduling a full set of helpful interviews and all the interviewers who provided valuable information and insights for this report. In addition, the team wishes to thank those within the various Government Ministries, donor organizations, universities, NGOs, and private sector firms who were so generous with their time and patient during the course of our conversations. We trust this combined effort will lead toward meaningful ICT-related action that will bring about substantive improvements throughout the OECS region and St. Kitts and Nevis.

St. Kitts and Nevis: ICT Assessment

I. Background/Context

This Information & Communication Technology (ICT) Assessment was undertaken by Carana Corporation, under contract to the U.S. Agency for International Development (USAID). The Assessment is part of a larger initiative being undertaken by USAID/Carana in support of the Organization of Eastern Caribbean States (OECS), specifically to provide technical assistance to the Eastern Caribbean Telecommunications Regulatory Authority (ECTEL) and the five National Telecommunications Regulatory Commissions (NTRCs).

In summary, the technical assistance being provided to OECS, ECTEL, and the NTRCs, is primarily oriented toward telecommunications market liberalization in the region. However, this is in support of an even larger purpose--that of seeking to leverage ICTs for economic growth within the Eastern Caribbean region.

This ICT Assessment reaches beyond the telecommunications issues; it seeks to gain a broader understanding of the overall utilization of ICTs in St. Kitts and Nevis (SKN) and to analyze supporting educational and Governmental considerations. The primary purpose of the Assessment is to identify current constraints to and opportunities for advancing ICTs in the region. The ICT Assessment is being coordinated closely with the OECS Secretariat and is considered Phase I of a two phase initiative. Phase II is a regional policy and strategy initiative being carried out by GOPA through World Bank (WB) funding. Thus, this ICT Assessment will serve as a precursor to the follow-on GOPA regional policy and strategy work.

This ICT Assessment for St. Kitts is the last of five ICT Assessments to be carried out for each of the ECTEL countries during February and March 2002. Combined, these five ICT Assessments will provide direct input into the GOPA initiative that is scheduled from March-June 2002.

In addition to providing support to OECS/ECTEL, this ICT Assessment is being carried out in a manner consistent with USAID's focus on leveraging ICTs in developing and emerging economies. In recent years, USAID's increased attention on using ICTs for international development was reinforced by the G-8 Summit that took place in July 2000 in Okinawa, Japan, and the subsequent adoption of the Digital Opportunity Task Force (DOT Force) Agenda in Genoa, Switzerland in 2001.¹

In large part, the increased global focus on the significance of information and communication technologies (ICTs) to economic development is predicated on the growing awareness of the beneficial impacts that ICTs have had on the U.S. and other developed economies over the last decade. While the "dot-com bubble" produced speculative excesses and market failures, for the most part these excesses have been identified and purged. The underlying reality is that Internet usage and traffic continues to surge and that the value of e-

¹See DOT Force official Web site at <http://www.dotforce.org/about/>.

commerce transactions has grown steadily. E-commerce now dominates some businesses segments like air travel, accounting for the majority of ticket sales. The enormous value of the online service and product markets during the last decade justifies this attention. The actual impact of ICTs has been captured and well documented in a series of annual reports prepared by the U.S. Department of Commerce, culminating with the June 2000 report, *Digital Economy 2000*.² A brief summary of this report is reflected in Appendix A.

The interdependent ICT sector consists of both “stand-alone” products and services as well as networked services and products. Increasingly, it is communications connectivity that gives ICTs their greatest value. ICT output extends the traditional understanding of public networks; IT products and services extend the reach of the public switched telephone network (PSTN). The ICT infrastructure includes the PSTN and encompasses data networks, hardware, software and services that together form the networked environment. Of these components, besides the PSTN, the most important is the public Internet, but there are significant changes in this area as well. TCP/IP technologies that used to rely on the telephone pipe have essentially superseded the physical telephone infrastructure by becoming the value-added part of the network and the mechanism by which voice and data service is now offered.

In other ways, this reliance on the traditional PSTN has broken down as wireless Internet access is available to mobile subscribers and even in some areas that have not been or cannot be – and may never be -- wired because of their difficult terrain. Internet access to these remote areas is provided by satellite technology even though such service has additional limits on speed and bandwidth. For example, high-speed satellite Internet access operates at 512 kbps transmission speed rather than at DSL rates. Nevertheless, the term “pipes” should be understood to cover both the traditional PSTN infrastructure of switches, telephone plant, and databases plus IP routers, LANs and Ethernets, computer servers that perform multiple functions in data networks, and the vast interconnected global network known as the (public) Internet.

For many people, the public Internet has come to represent ICT because it enables e-commerce, e-government, and multimedia environments. Internet deployment has become a default measure of a society’s technological prowess and achievements and the ability to handle leading edge ICT environment. St. Kitts and the other OECS states are geographically close to the world’s most advanced Internet markets – the U.S. and Canada – but lag far behind them by several ICT measurements. Narrowing this gap in the long-term will improve these nations’ ability to participate fully in globalized ICT markets.

Being late to e-commerce and ICTs, OECS members should attempt to turn their tardiness into advantages by picking those solutions, software, and hardware that have worked best and promise to be the optimal choices for their countries.

² *Digital Economy 2000*, U.S. Department of Commerce, <http://www.esa.doc.gov/de2k2.htm>.

ICT Assessment Structure/Approach

This ICT Assessment has been structured in such a manner as to provide not only a basic uniformity among the five ICT Assessments being carried out for ECTEL, but also a level of consistency with similar USAID-funded assessments. As such, it relies on a “4-Ps” template in an effort to capture and categorize information from a wide array of sources and to present it to the reader in a readily digestible format. The four “Ps” are as follows, with a section of this report devoted to each:

- 1) **Public Sector**—This section focuses primarily on (a) Government ICT policy and the supporting legal/regulatory framework and (b) the actual use of ICTs by the Government. The coverage of telecommunications policy is minimal due to parallel ECTEL/NTRC work in this area.
- 2) **Pipes**—The thrust of this section is on telecommunications infrastructure, access, and price. It relies upon a core set of information from the International Telecommunications Union (ITU) Development Indicators reports.
- 3) **Private Sector**—This section examines the state of development of the IT industry sector and the use of ICTs by traditional businesses.
- 4) **People**—This section analyzes the education systems relative to producing students and workers with ICT-related skills.

From a methodology perspective, this ICT Assessment was carried out in two parts: (1) research based on a number of prior ICT-related studies and reports produced over the past 2-3 years by various organizational entities, and (2) a one-week on-the-ground assessment during which time a number of interviews were undertaken with individuals from the public, private, and educational sectors. Naturally, with such an abbreviated approach, this ICT Assessment report will not capture all the details.

In this regard, the ICT Assessment is a survey intended to gather sufficient information across a broad array of ICT-related sectors, but it is not designed to be a comprehensive reporting of details (several others have done an excellent job of this in selected areas). This Assessment intends to support recommendations put forward to OECS and USAID regarding potential areas for future engagement. Its purpose is to be a catalyst, not a catalog.

Prior ICT-Related Studies

The Bibliography, captured in Appendix C, reflects a number of information sources, including earlier studies, which have been taken into account in carrying out this ICT Assessment. Many of these proved to be invaluable resource materials in preparing this report. One of the more recent, and valuable, reports was undertaken in June-August of 2001 by Alwyn

Didar Singh on behalf of the Commonwealth Fund for Technical Cooperation. The report, *A Rainbow Technology for a Rainbow People: E-Business Capacity Development for the CARICOM*,³ incorporated the Harvard Center for International Development's "Readiness for the Networked World" assessment methodology as part of its analysis.⁴ As such, the report reflects a country-by-country review of key ICT-related issues using the Readiness Guide's e-readiness framework of:

- ◆ Infrastructure Framework (Connectivity and Cost)
- ◆ Policy Framework (E-Leadership and Participation)
- ◆ Legal Framework (Security and Privacy)
- ◆ Human Capacity Framework (E-enabled Human Capital)
- ◆ E-Business Environment: Enabling Seamless E-Commerce
- ◆ The International and Regional Framework.

The report provides an organized overview of the e-commerce and e-business for individual Eastern Caribbean states, for the region as a whole, and for the group of emerging economies to which all of the eastern Caribbean states belong. This ICT Assessment in no way seeks to duplicate the excellent efforts of this study, but rather intends to help move an ICT agenda forward in key areas of interest to SKN, OECS, and USAID. Also helpful has been "The Development of the Informatics Industry in St. Kitts and Nevis" issued by the United Nations' Economic Commission for Latin America and the Caribbean on June 5, 2000.

The Country of St. Kitts and Nevis

St. Kitts and Nevis is an independent federation with a parliamentary democracy based on the British model with Queen Elizabeth II of the United Kingdom as the head of state. It is the only federation in the Caribbean. Nevis has its own island assembly of five members, a premier, and a deputy governor general. They became independent of Britain in 1983 and are a member of the Organization of Eastern Caribbean States. The population totals approximately 41,000, of which 34,000 reside on St. Kitts and 7,000 in Nevis. St. Kitts and Nevis occupy an area of 168 square kilometers and 93 square kilometers respectively.

St. Kitts and Nevis differ from their OECS neighbors in two other important ways: first, in its small population and compact size, and, second, in its relative economic well-being. Allowing for statistical imprecision, the World Bank estimates SKN's 2000 GDP to be US\$314 million with a per capita income at US\$6,570 -- substantially more than its fellow OECS members. Officially, the unemployment rate is between 4.5 – 5.0 percent. Unofficially, it is estimated to be as high as 12 percent, including discouraged job seekers and the underemployed.

³ Alwyn Didar Singh, *A Rainbow Technology for a Rainbow People: E-Business Capacity Development for the CARICOM (draft 15.0.01)*, Report of Diagnostic Mission, Commonwealth Fund for Technical Cooperation, Commonwealth Secretariat, London, June-August 2001 (hereinafter "*Rainbow Report*").

⁴ "Readiness for the Networked World," <http://www.readinessguide.org>.

In past years, the country enjoyed robust economic growth but has recently encountered serious problems. In 1998, the country was severely set back when a destructive hurricane caused hundreds of millions of dollars of damage to infrastructure and tourism facilities. The sugar industry, which remains a major employer and contributor to the economy, is in long-term decline as major markets are closed to sugar imports. The September 11 terrorist attacks reverberated widely throughout the Caribbean, which suffered a major downturn during its high tourist season.

The country has met these challenges by rebuilding its tourism facilities and diversifying into other industries ranging from financial services, light manufacturing, specialized agriculture, and electronics/informatics. The Government actively seeks FDI to further its diversification efforts and offers generous incentives to investors, such as a corporate tax holidays, export allowances, and exemption from import duties on many items. Industry-specific incentives are available for investments in tourism and financial services.

St. Kitts and Nevis: ICT Assessment

I. Public Sector

A first critical component of this ICT Assessment was an evaluation of the Government of St. Kitts and Nevis' (SKN) position relative to ICTs. Specifically, this focused on two key areas:

- 1) The Government's policy and legal framework pertaining to the areas that directly and indirectly impact the widespread deployment and utilization of ICTs within SKN (specifically with regard to telecommunications and e-commerce); and
- 2) The Government's actual use of ICTs to provide e-government services and benefits to citizens and to automate and streamline key Ministries and the functions/activities that they carry out.

As a general proposition, St. Kitts and Nevis are in a good position to further the deployment of ICTs in the economy and public sector and to increase ICT usage throughout society. Although it no longer enjoys rapid economic growth, on a per capita basis, it is still substantially wealthier than the other OECS members and most Caribbean nations. Therefore, the ICT purchasing power of the economy may be adequate to sustain related ICT growth. Its population is highly literate, hardworking, and resourceful. SKN is devoid of the serious economic problems, such as structural unemployment, that plague some of its neighbors. Its small population offers scale advantage since training programs and other initiatives can be implemented quickly and results rapidly determined.

A fundamental characteristic of the political and economic environments in SKN, and elsewhere in the region, is the immense role that government plays in developing, determining, and executing policy. Such a role is common in developing economies, as there is often a shortage of capital and managerial expertise in the private sector. As the economy matures, however, the private sector needs to assume a more active role in economic policy affecting ICT and related sectors.

Part I below identifies a list of ICT issues in which the public sector either needs to become more involved or continue its involvement. Some developments, such as trade negotiations, are being driven by global forces over which SKN and the other OECS members have little control. These policy matters demand far greater resources than any one country could allot to them. They become less forbidding if the OECS members were to pool their resources, knowledge and experiences. Mechanisms covering specialized subjects, e.g., e-commerce, could link Government and private sector experts to their counterparts in other governments in the region.

Summary/Analysis

The Government of SKN does not currently have in place a comprehensive national ICT strategy. However, the Ministry of International Trade, Labour, Social Security, CARICOM Affairs, and Telecommunications and Technology has been working on a draft plan that is intended to fulfill this purpose. Up to this point, it is unclear whether the lack of a comprehensive plan has adversely affected the use and deployment of ICTs in the economy. A comprehensive ICT strategy would be of great value going forward by providing a detailed roadmap of the path ahead. Moreover, a written strategy will help minimize confusion, improve coordination among various stakeholders, clearly articulate the goals and objectives, and improve understanding of impediments.

Strong political support from the Government is an essential ingredient. The preparatory work in preparing the strategy should continue, including facilitating the necessary political mechanisms to ensure Prime Minister and Cabinet support.

In his 2000 survey of e-readiness and capacity for e-business of various Caribbean countries, Alwyn D. Singh found that little had been done by SKN to update laws to accommodate the emergence of online commerce and communications. E-commerce affects a vast array of subjects and issues and entails an enormous commitment of resources. E-business and online activities are requiring countries to examine subjects that range from the general to very specific e-commerce issues and policies. Laws dealing with cybercrime are non-existent. Laws to facilitate online transactions and communications, such as digital signature and electronic transaction laws, are also absent. Other statutes, such as those dealing with intellectual property rights (IPR), need to be updated for the online environment. Consumer protection, children's protection, and privacy laws that are important to the new ICT environment are also needed so that users feel more confident when they go online to surf the Net or to conduct business.

These legal/regulatory gaps are important and must be addressed. Jurisdiction over online activities must also be addressed. Some countries take an expansive view of their courts' legal jurisdiction, while other countries accept only a limited jurisdiction of other countries' courts. At present, St. Kitts and Nevis and other Eastern Caribbean nations lag in development of their legal/regulatory frameworks to accommodate the widespread utilization and deployment of ICTs. It is important that a legal analysis be undertaken to identify gaps in the legal framework and where new laws are needed. This must be done, however, in harmony with the developing global legal framework.

Furthermore, the SKN Government needs to identify operational policies and practices that will be substantially affected as a result of increased usage of ICTs and an online environment. This includes requirements for authentication, certification, network availability and reliability, and combating cybercrime. For example, all enterprise networks (which includes Government networks) now face the threat of attack or unauthorized intrusion. The administrators of SKN's Government network must be prepared to handle security breaches and

restore systems. SKN law enforcement officials need to be trained in how to conduct cybercrime investigations and cooperate on an international level, and forensic scientists need to develop skills in handling electronic evidence. At a minimum, this means establishing round-the-clock contacts and obtaining assistance from the U.S., EU, and other governments and donor organizations. The area of cybercrime is but one example of how the SKN Government must anticipate problems that are caused or exacerbated by an interconnected global network.

As has been noted elsewhere,⁵ multinational institutions will also have an impact on ICT deployment and e-readiness. Chief among these are the WTO (World Trade Organization) and WIPO (World Intellectual Property Organization). The WTO has commenced a new round of trade negotiations entitled the Doha Round that will have, as a major component, a focus on e-commerce to fall under the General Agreement on Trade in Services (GATS). Since trade negotiations are still evolving, no firm trade-related ICT policies are required at this time. However, governments need to be aware of the negotiations and the relevant issues and to educate themselves about the evolution of the debate so that they can fully participate and not be blindsided when decisions are made during the negotiations. The SKN Government will be working through CARICOM.

IPR is another e-commerce-related area about which SKN must be aware. In 1996, the WIPO concluded a new treaty on copyrights that seeks to limit the copying that is legally permissible in the digital electronic environment. For example, it specifically limits the copying that can occur during transmission via electronic means, including a PC. It requires its members to adopt laws consistent with the treaty and to enforce its provisions. The treaty has gone into force, and WIPO is encouraging members to become signatories. If SKN signs the treaty, it will be obliged to impose limits on personal and enterprise behavior, which will have to be reflected in its other e-commerce laws.

Discussions on e-commerce are also underway under the aegis of the Free Trade Area of the Americas. They are taking place within the framework of a special committee entitled the Joint Government-Private Sector Committee of Experts on Electronic Commerce. There may be additional discussions on this subject, though that is unclear, as it is not a priority for many countries with an underdeveloped e-commerce sector. In any case, Eastern Caribbean states face issues of how best to participate and coordinate their positions to maximize their collective impact.

The Government of SKN strongly supports competition in fixed and mobile services. Even before the official liberalization date of April 1, 2002, it encouraged fixed wire competition to C&W. The Cable, a cable television provider that offers video, cable telephony, and high-speed Internet access on SKN, was encouraged to offer competing services to C&W. Similarly, there is limited competition in outbound international calling via a VSAT, which serves the new St. Kitts telemarketing call center.

⁵ *Rainbow Report* at 14.

Even though the Government appears to be fully committed to liberalization, the NTRC will have only two full time staff members -- a number too small to vet fully all of the telecom-related matters that can be raised by carriers, service providers, and the Government. The five NTRC commissioners have been appointed, but the two staff had not been selected at the time of the Assessment visit.

If experience elsewhere is a reliable guide, the two-person staff can expect to be overwhelmed by sharply contending claims, filings, mediation requests, and other time-consuming matters. Under such circumstances, it is possible that simply operating the NTRC on a day-to-day basis will be difficult. The NTRC must coordinate with ECTEL to secure effective implementation of its Telecommunications Act. It is, therefore, imperative that the NTRC receive assistance in understanding its role, procedures, and responsibilities to enable it to manage its caseload and effectively perform its duties.

Because the Government has a minority investment in C&W (St. Kitts) Ltd. and The Cable is 69 percent Government-owned, the General Manager of the local C&W subsidiary suggested to the Assessment team that it “makes sense” for the two companies to merge their networks so they could avoid redundant lines and duplicative costs. The rationale was that by having only a single wire pair to each customer, they would “maximize [their] capital investment.” Aside from lack of interest from The Cable, a combination of these networks would eviscerate the very notion of competition and liberalization. Accordingly, the NTRC and competition officials need to guard against attempts or suggestions by licensees to circumvent competition regardless of rationale.

Although there has been some utilization of ICTs for internal Government operations, the SKN’s Government’s performance has been uneven. Only a few Government agencies, such as the Fund for National Development (FND), have an online presence. This is likely due to the lack of a national strategy and strategic plan for leveraging ICTs. Thus, there is no overarching, consistent vision of the Internet presence that the SKN Government would like to achieve, its format, or the services that it would place on the Internet.

While the Assessment team was in St. Kitts, the Prime Minister sponsored a meeting on e-government for his Cabinet, political staff, and senior civil servants. He clearly demonstrated his personal interest in, and commitment to, e-government. However, it is not clear whether a lead agency has been designated to coordinate e-government initiatives. The FND’s Web site primarily posts financial data with no interactive features or value-added. By contrast, the St. Kitts and Nevis Development Bank (SKNDB) does not plan to have an Internet presence until it can also offer online services such as loan repayment; this is expected to take another year to 18 months. These two contrasting perspectives and approaches indicate a lack of clear, coherent Government strategy. The Prime Minister’s e-government meeting suggests increased involvement on his part in setting e-government policies, but it is only the very first step out of many that needs to be taken.

E-government initiatives should receive a boost when SKN regains administrative control over its country domain name “.kn,” which is currently being administered by the University of

Puerto Rico. The lack of domain name control makes it difficult to design the taxonomy of second level domain names, i.e., the internal organization of categories, which in turn governs how it is to be used for e-mail and Web sites, and to sell and market “.kn” Internet addresses. E-mailing Government officials requires a correspondent to use C&W’s e-mail service, caribsurf.com, or one of the popular, free e-mail services like “yahoo” and “hotmail.” It is important to regain administrative control over the country code domain name (cc-TLD) for product and service branding and to increase the value of the domain name in e-commerce and electronic communications.

Identified Areas for Further Pursuit

SKN has two advantages as it leverages ICTs for economic development: (1) its relative prosperity and strong economic growth and successful economic diversification efforts (although growth has slowed in recent years), and (2) its small size, which can make administration and governance easier than in a large country. The U.S. recession and downturn in discretionary travel hit the country’s tourism sector hard while it was still recovering from the effects of the 1998 hurricane. The World Bank estimates that GDP growth in 2001 plummeted to well under half the pre-hurricane figure.⁶ While the precise impact of the slowing growth rate on public policy and the promotion of ICTs cannot be predicted, it is inevitable that the SKN Government must focus on greater near-term constraints.

By awarding a fixed-service license to a well-financed and experienced local company, The Cable, the Government has maximized the prospects for effective long-term competition. Since The Cable operates its own network, it does not rely on the incumbent carrier for facilities or service except for high level interconnection to enable the two networks to exchange traffic. Similarly, the new mobile operator will have its own facilities and requires only interconnection points to enable them to terminate each network’s calls. The Cable’s deployment of a fiber ring around St. Kitts and the upgrading of its network to carry Internet traffic and packetized voice represent early down payments on liberalization.

Although SKN has gotten off to a good start in this new competitive era, this report has identified several areas critical to the deployment and utilization of ICTs in SKN. The following represent a few priority “Public Sector” issues where additional attention is needed.

A. Continuing Support for Telecom Liberalization. Liberalizing the telecommunications market through the implementation of the Telecommunications Act and corresponding regulations could be more contentious and time-consuming than many stakeholders may have anticipated. In North American and European markets, incumbent carriers try to exploit their advantages early, while frustrating market opening actions, through extended private negotiations, procedural delays, and

⁶ See <http://www.imf.org/external/country/kna/index.htm>. In 2001, the real GDP annual percentage fell by 1.8, compared with a 7.5 change in 2000. In 1997, prior to the 1998 hurricane, the GDP had a sharp rise of 7.3, hence only 1.8 in 2001 being well under half the pre-hurricane figure.

judicial complaints about the regulations and legislative tactics. In some instances, incumbents have been fined for violating liberalization rules and competition policy. They appear to accept these fines as part of the cost of doing business – and keeping their market shares and high prices.

SKN has indicated that it will rely on ECTEL's policy and technical expertise in dealing with interconnection questions rather than developing internal expertise. This course of action was foreseen and permitted by each country's updated telecommunications law. Strong public support for ECTEL by the SKN Ministry of Telecommunications may be needed if competitive issues are to be effectively addressed by the regional body. If the incumbent carrier mounts a serious legal challenge to pro-competitive decisions, ECTEL members may need to supplement their current staff with experienced regulatory attorneys. Fortunately, the interconnection and facility sharing issues that will arise in SKN are rather straightforward and have been addressed in other countries.

The NTRC office must be organized to run as efficiently as possible, with minimal support staff and services, particularly with regard to its new regulatory role. The Commission will clearly need a reliable records management system. Such a system may be available from another national regulatory body that may consider donating the software to the NTRC. The Commission could be an ideal candidate to be an agency leader as the Government accelerates its e-government initiatives. By placing more information about the NTRC and its operations online, the Commission could also be a pacesetter in e-government implementation.

- B. Legal and Regulatory Framework for E-commerce.** ICTs have led to new electronic markets that extend customer choice while resulting in significant benefits in efficiency. This new environment, however, requires new policies and laws and amendments to existing legal frameworks. For e-commerce to flourish in SKN and become a significant economic factor, market participants must have confidence that transactions will follow predictable guidelines and that the rule of law will protect all stakeholders. A basic legal framework must cover an extensive list of issues and policies, beginning with electronic transactions, digital signatures, privacy and protection of data, cybercrime, consumer rights, dispute resolution, and jurisdiction of courts to hear disputes, to name a few. The absence of a comprehensive legal/regulatory framework does not preclude online commerce but it will limit the value and growth potential of electronic markets. The task of reforming or adopting new laws will be time consuming and the OECS members should consider regional initiatives and mechanisms to share information to facilitate the process. The task of identifying laws implicated in e-commerce requires the active participation of both the private and public sectors and the dedicated assistance of local attorneys and experienced consultants who know the global legal framework and the issues under discussion.

- C. ICT Use by Government and E-government Initiatives.** With minor exceptions, the SKN Government appears fully committed to deploying information and communications technologies more widely throughout Government. For the most part, ICTs are currently used for point-to-point communications, rather than to deliver services and Government information more readily available or to enable citizens to communicate with their Government. Some Government information is available online, but there is no consistent, uniform policy pertaining to information disclosure and publication. The Prime Minister has met personally with private sector consultants to discuss successful programs abroad and the development of integrated consistent policies to guide future initiatives. One aspect of e-government that must be thoroughly addressed is how to improve program design and organizational structures to accommodate the new online environment. Few, if any, programs were originally designed with ICTs specifically in mind. The Prime Minister's personal interest give this sector the necessary political blessing, leadership, and political urgency, and he has access to experienced IT consultants who can help SKN develop a national plan and strategy to advance ICTs. As each country has its idiosyncrasies, ordinary citizens and industry must be part of the process of designing and rolling out e-services to ensure their appeal to and use by local citizens.
- D. Expanding SKN's Internet Presence.** The lack of an Internet presence by the Government is largely due to the underutilization of the Web by Government agencies for basic services such as posting information, much less hosting services and applications. Once control over the ".kn" country name is regained, there should be more Web sites with the country name. The Government may wish to encourage a shift to the ".kn" domain. More importantly, the Government and the private sector should consider the value of a content-rich national portal with an anchor in interactive e-government services. Simultaneously, the Government should engage its neighbors in discussions regarding the establishment of a regional portal to enable Caribbean enterprises to more effectively market their goods and benefit from the synergies and strengths of one another.
- E. Online Training for Government Officials** Large multinational enterprises now effectively offer training programs via distance education. The basic infrastructure of training programs consists of servers that store and transmit the streaming data over the interconnecting network. This application will become increasingly attractive if – as should occur – prices for broadband Internet services decline in a competitive environment. Financial considerations are only one factor to be considered.

St. Kitts and Nevis: ICT Assessment

II. Pipes

One of the underlying components increasingly recognized as critical to the development of any nation is the communications infrastructure. In recent years, this has become even more important as globalization expands and nations increasingly rely upon ICTs to participate in the global marketplace (e.g., e-commerce and e-business).

This portion of the ICT Assessment examined the in-country telecommunications environment from several perspectives and levels, including:

- 3) Summary/findings of the communications infrastructure in SKN; and
- 4) Key observations from 1999 International Telecommunications Union (ITU) data.

Summary/Findings

Telecommunications Infrastructure

As was true in all ECTEL member states prior to liberalization, the local exchange carrier (Cable & Wireless [St. Kitts and Nevis] Ltd.) has enjoyed a monopoly franchise for all telephony services. It has deployed a double fiber ring around St. Kitts and a fiber link to its international gateway switch. St. Kitts and Nevis are connected via microwave. The Cable, C&W's licensed fixed wire competitor, also has deployed a fiber ring plus fiber strands to high-density business sites. Its traditional cable subscribers are served over a hybrid fiber coaxial (HFC) network.

In spite of an adequate but unexceptional telephone network, business people, public officials, and residential customers alike complain about C&W's high prices and, secondarily, about its network reliability. Outbound international calls cost several multiples of comparable inbound calls. One large multinational financial institution complained that C&W was being unresponsive to imminent competition and was reluctant to substantially reduce its prices without locking the customer into a three-year contract. Fractional T-1 service, which one services firm uses for Internet hosting, back office data processing, and related applications is several times U.S. prices, running at EC\$8,000+ per month. Local service is metered, making both telephone and dial-up Internet service significant expenditures for consumers. Most analysts agree that flat-rate pricing was a principal – if not *the* principal – cause for the early broad availability of Internet access in the U.S. and Canada and their subsequent leadership in Internet technologies. Consequently, this pricing structure is holding back a nation of people.

Competition

Two service providers have been licensed to compete against C&W - The Cable in fixed services, including high-speed Internet access, and CariGlobe in mobile wireless. With two fiber rings, St. Kitts is better provisioned with modern transmission facilities than Nevis. The principal reason for this disparity is that C&W faces vigorous competition from The Cable, whose operations are limited to St. Kitts, where it serves roughly 10,000 customers, more than 95% of the potential market. The Cable, which is 69% owned by the SKN Government, claims that it has deployed more fiber than C&W.⁷ It plans to connect customers who need high bandwidth connections directly to its fiber ring via fiber. Residential customers who order high-speed Internet access will be served with a cable modem over the existing hybrid fiber coaxial (HFC) plant. Finally, it will compete head-to-head against C&W with its planned packetized voice service.

The Cable faces its own problems because it is currently unable to offer its customers international service. The Cable would like to tap into a non-C&W undersea cable that lies nearby SKN. However, C&W owns the only existing cable landing site and The Cable is negotiating with C&W for the right to use the landing site as its international gateway. If the two parties are unable to agree on terms and conditions, the issue is likely to be referred to ECTEL and the NTRC for resolution. Regulations issued pursuant to the Telecommunications Act of 2000 lay out general interconnection guidelines and procedures and also provide for infrastructure sharing (paragraph 33). The NTRC has the final authority to resolve interconnection and infrastructure sharing disputes subject to judicial review.

The Cable's ability to control and operate an end-to-end domestic and international network is critical if full telecom competition is to survive. Should The Cable obtain its gateway, it may be able to offer voice over IP (VOIP), a data technology that uses networks more efficiently and cheaply than traditional switched circuit technology. More importantly, it will be able to control its international calling prices. Because VOIP technology is cheap to use and maintain, the company will be in a position to reduce international rates if it wishes, improve network reliability and quality, offer good quality IP-based services, and better support businesses that are heavy users of bandwidth.

Both firms will have to overcome a reputation for uneven network reliability, especially C&W, whose customers have been frustrated by what they consider an expensive, unresponsive monopoly. Private and public enterprises tend to be reluctant to entrust mission-critical applications to an unreliable network. Last year, The Cable suffered a major embarrassment when its new high-speed cable modem Internet access failed because of equipment defects and it had to halt service until new equipment was installed. This resulted in a serious erosion of public confidence, especially among potential business customers, and the company now bears the burden of proving it can run a data network equal or superior to C&W's. Reliability and quality of service are just as, or even more important, to enterprise customers than price. Since the

⁷ It was not clear whether this figure included lit and dark fiber or only lit fiber.

reliability of cable telephony is not yet comparable to circuit switched technology, (approximately 99.99% uptime), its reputation for reliability is vulnerable.

CariGlobe, a local company, was recently licensed to provide competitive mobile service. It is C&W's sole wireless competitor. If the experience in other Caribbean nations is any guide, the new operator should attract a substantial part of the market, especially if it offers features not available from C&W. Both The Cable and the mobile operator will operate with a handicap because they cannot match the full menu of telecom services available from C&W. Because of its financial strength, C&W is also in a position to cross subsidize services in ways that some describe as anti-competitive. It remains to be seen whether bundling will confer a competitive advantage upon C&W. This caveat notwithstanding, the competitive environment in SKN is characterized by a few, but relatively strong, providers who are expected to have the financial resources, experience, and technological strength to offer C&W serious competition. With its new fiber ring and cable network, the competitive local exchange company has already demonstrated the benefits of liberalization.

Competition policy matters are also raised by the unusual market structure in SKN, because the Government owns a substantial part of Cable & Wireless (St. Kitts) Ltd., a majority interest in The Cable, and majority ownership of a major user/customer St. Kitts Call Center. At a minimum the Government's ownership in competing entities creates a market tension because these different stakeholders have dissimilar, even divergent, interests. It is easy to foresee a situation in which the three firms might seek to influence the Government all on the basis of maximizing the Government's investment in their respective firms. This situation is particularly acute with the Government's investment in the two competitors – C&W and The Cable – when market and policy neutrality must be maintained. It is also problematic to have Government entities regulating its own business interests. Privatization of Government interests would be a good future step.

SKN enjoys a relatively high teledensity and growth in telephone lines. There are also some 3,000 Internet accounts in the country, which is relatively high for an emerging economy with high Internet-access prices. Near universal access, as defined by access to a telephone, is not an unreasonable goal. Moreover, as competition takes hold, the price of telephone service should decline and be affordable for most customers. Market forces may result in universal service without governmental intervention, however, both cable and telephone lines have limitations on distance, and some rural inhabitants may encounter problems in obtaining affordable telephone and cable service and high-speed Internet access. For this group, satellite-based video and Internet access may be the only alternative. High-speed Internet access via satellite is now provided by several service providers and the technology has become common. Although satellite-based service is limited to 512 kbps compared to the much higher speeds of DSL and cable modems, there have been steady improvements in both the technology and the service in recent years. The principal constraint of these new services is likely to be pricing.

ITU Telecommunications Information – 1999 Statistics

Each year the International Telecommunications Union (ITU) publishes a *World Telecommunications Development Report (Development Indicators Report)*⁸ that provides statistical data for all countries. Its most recent comprehensive report, issued in March 2001, included an expanded set of data that, for the first time, included data on mobile cellular. In addition to this worldwide report, the ITU periodically publishes regional-specific reports with more detailed discussions on a given geographical region. In April 2000, an *Americas Telecommunications Indicators 2000* report was published that provided useful data for this Assessment.⁹

The ITU-compiled data serves as a rich resource that is helpful in understanding the dynamics taking place in telecommunications. While there are several acknowledged weaknesses in the reports (such as timing, accuracy, and incompleteness), they still remain the best set of normalized data from which trends can be identified and macro-level regional/country comparisons can be made. For purposes of this ICT Assessment, selective 1999 data (the most recent available from the ITU) has been extracted from the 2000-2001 *Development Indicators Report* for the ECTEL countries, plus a few other Caribbean Islands (Barbados, Jamaica, and Trinidad/Tobago). Combined, this provides an additional basis for grasping the current telecommunications situation in the ECTEL countries, including St. Kitts/Nevis.

The following key observations were derived from reviewing and analyzing these sets of data. The actual data from which these were prepared are contained in Appendix B of this report.

Basic Indicators

- The populations of the ECTEL islands are small (typically less than 100,000), but relatively concentrated (with between 100 to nearly 300 people per square kilometer), due to the small size of the islands. St. Kitts occupies 168 square kilometers, while Nevis occupies 93 square kilometers.
- The economies of the ECTEL islands are relatively small (between US\$300-600 million annual GDP), but on a per capita basis, they are relatively high (between US\$2,400-6,000 per capita GDP), placing most ECTEL countries in what is considered the Upper-Middle income band. SKN's GDP is US\$300 million, but with a high GDP per capita of US\$6,840, compared with the next highest ECTEL country, St. Lucia, which has a GDP per capita of US\$3,815.
- Relative to the world average for Upper-Middle income countries, the ECTEL countries have a higher than average teledensity (ranging from 28-52 whereas the average is 20); SKN's teledensity is the highest of all ECTEL countries at 51.76%.

⁸ *World Telecommunications Development Report 2000-2001-- World Telecommunications Indicators*, ITU, Geneva, March 2001.

⁹ *Americas Telecommunications Indicators 2000*, ITU, Geneva, April 2000.

St. Vincent/Grenadines is a Lower-Middle income country, but here too, it is above the average of similar countries (teledensity of 21 versus an average of 12).

Main Telephone Lines

- With the exception of St. Kitts/Nevis and St. Lucia, growth in main lines and teledensity between 1995 and 1999 is less than the world averages for similar income level countries; Grenada's compound annual growth rate (CAGR) in main lines, for example, was 6.1 percent compared to 9.1 percent for Upper-Middle income countries, but close to the world average CAGR of 7.0 percent. SKN's growth in main lines was 8.6 percent, and its growth in teledensity was 9.3 percent – the highest of any ECTEL country.

Local Telephone Network

- Used switching capacity across all the ECTEL countries is 61-83 percent (Grenada is 83 percent). The world average is 81.4 percent and the average for Upper-Middle income countries is 84.4 percent. Dominica and St. Vincent/Grenadines fall significantly below this rate, with only about 61 percent of switching capacity used. Figures were not available for SKN.
- All the switching capacity for the main telephone lines is 100 percent automatic and digital.
- The percentage of main telephone lines that are residential is higher than countries with comparable income levels (76-85 percent versus an average of 75 percent for Upper-Middle income countries). Seventy-seven percent of SKN's lines are residential.
- While the data is not available for all ECTEL countries, the faults per 100 main lines appears significantly less than other Lower-Middle and Upper-Middle income countries (no doubt due in part to digital switching and a more concentrated user base). Grenada has only 1.1 faults per 100 main lines per year, compared to an average of 19.8 for Upper-Middle income countries. Figures were not available for SKN.

Teleaccessibility

- The percentage of households with phones throughout the ECTEL countries is considerably higher than the world averages for the Lower-Middle and Upper-Middle income countries (70->100 percent compared to 38-58 percent; SKN has >100 percent residential main lines per 100 households).
- The ECTEL countries' number of public telephones per 1000 inhabitants is quite close to the world average for their respective income level, however, as a percentage of main telephone lines, they are somewhat lower than the world average (likely due to the high level of phone lines that exist in households). SKN has 4.23 public telephones per 1000 inhabitants, which slightly exceeds the Upper-Middle income average of 4.22.

Largest City Main Lines

- With the exception of Dominica and St. Vincent/Grenadines, the percentage of the population of the ECTEL countries living in the largest city is considerably higher than comparable income level countries, but likely consistent with small island nations. SKN has 54.2 percent of its population living in its largest city.
- Teledensity of the largest ECTEL cities appears to be quite high (53-82 compared to 28 for Upper-Middle income countries) but, again, this is likely due to the nature of island nations. However, some data is missing for several of the islands. Grenada's largest city teledensity is 53.3 compared to an average of 27.87 for Upper-Middle income countries. Data was not available for SKN.
- There is a significant disparity between the teledensity of the largest city and the rest of the country (e.g., for Dominica, the largest city which contains only 13.5 percent of country's population has a teledensity of 82.22, whereas the rest of the country has a teledensity of 17.37). This is an extreme situation, but reflects the disparity, even though in most cases this is not as exaggerated. Grenada's teledensity for its largest city is 53.3 compared to an overall country teledensity of 31.51. Figures were not available for SKN.

Telephone Tariffs

- Connection rates for linking up telephone service are typically less in ECTEL countries than in countries with similar income levels (for both residential and businesses). For Grenada, the costs are close to the world average for Upper-Middle income countries (US\$85 for both residential and business compared to average of US\$82 and US\$129). SKN's connection rates are quite low at US\$2 for residential connection and US\$27 for business.
- Monthly subscription costs for SKN are lower than the average for Upper-Middle income countries (for residential, US\$3 compared to US\$8.10; and for business, US\$3.70 compared to US\$15.60). It should be noted that this is 1999 data.
- SKN's Telephone Tariffs as a percentage of GDP are very low compared to other Upper-Middle income countries (0.6 percent compared to an average of 1.8 percent).

Cellular Subscribers

- Cellular/Mobile data for ECTEL countries is sketchy and, therefore, its use is limited for drawing conclusions.
- It is clear that the entry of Cellular/Mobil has been late in coming to the ECTEL countries, and that, across the board, the growth rate between 1995 and 1999 has been considerably less than the growth in countries of similar income levels (24-60 percent on a very small base, whereas the average growth rate for the Upper-Middle income level is nearly 85 percent for this same period). SKN's compound annual growth rate for 1995-1999 was not available.
- Teledensity of Cellular/Mobile as of 1999 is considerably less than countries with comparable income levels (teledensity of Cellular/Mobil of ECTEL being between 1

and 2 whereas the average for Lower-Middle is over 2, and for Upper-Middle income countries it is over 13). SKN's teledensity of Cellular/Mobile subscribers is 1.81.

- Cellular/Mobile as a percentage of the total teledensity is considerably less than averages for comparable countries (3-6.5 percent compared to 16-40 percent). This is due to a late start, but also likely influenced to some degree by the relatively high main line telephone teledensity. The total teledensity for Cellular/ Mobile subscribers in SKN is 3.4 percent.

International Telephone Traffic

- The outgoing international traffic from the ECTEL islands on a per inhabitant basis is completely “off the charts” relative to comparable income level countries (88-333 minutes per inhabitant for ECTEL countries compared to an average for Upper-Middle income countries of 16). SKN's outgoing international minutes per inhabitant topped the ECTEL countries at 337.3.
- On a per subscriber basis, this comparison is equally significant (333-652 minutes compared to 79 minutes for Upper-Middle income countries). SKN has 651.7 outgoing international minutes per subscriber – by far the highest of any ECTEL country.
- These disparities are most likely due to the nature of a tourist-based economy, but are also likely to be partially due to island Diaspora and family members living in the U.S., U.K., and Canada.
- The extremely high outgoing international traffic is a real “cash cow” for the incumbent telecommunications provider and will require serious attention during market liberalization.

Telecommunications Staff

- Across the ECTEL countries, it is quite clear that between 1995 to 1999, the current telecommunications provider (C&W) has been undergoing cost-reduction efforts, including dropping staff (0.3 – 7.2 reduction in staffing for this period).
- The number of main lines per telecommunications employee has naturally grown over this same period, but for the Upper-Middle income countries, ECTEL countries are still considerably below the world averages (107-130 lines per employee compared to an average of 179 for Upper-Middle income countries and a world average of 154). For St. Vincent/Grenadines, the comparison is favorable (142 compared to an average for Lower-Middle income countries of 92). SKN has 119 main lines per employee.

Telecommunications Revenue

- While information is sketchy for the ECTEL countries, on a per inhabitant basis, telecommunications revenue is considerably higher than the average for similar income countries (US\$219 compared to US\$31 for Lower-Middle income and US\$175-713 compared to US\$146 for Upper-Middle income countries). SKN tops the list at US\$712.6 telecommunications revenue per inhabitant.

- There is also considerably higher revenue for the ECTEL countries on a per line basis as well as a per employee basis (US\$628-1,512 compared to US\$733 for Upper-Middle income countries and US\$256 for Lower-Middle income countries). Again, SKN is highest at US\$1,512 telecommunications revenue per main line.
- Telecommunications revenue as a percentage of GDP is also very high for the ECTEL countries (5.1-10.4 percent compared to an average of 2.1 percent for Lower-Middle and 2.9 percent for Upper-Middle income countries). In SKN, telecommunications revenue accounts for 10.4 percent of GDP.

Telecommunications Investment

- The ITU report does not provide sufficient information on the ECTEL countries to detect much in the way of telecommunications investments other than to say it appears to be within the averages relative to population, but lower than average relative to telecommunications revenue.

Information Technology

- Overall, the number of Internet hosts in the ECTEL countries is considerably below the averages for similar income countries. Dominica, while still under the average, is at least close (excluding Dominica, the range is .3-2 hosts per 10,000 population whereas the average for Upper-Middle income countries is 37; Dominica is 24). SKN has 2.06 hosts per 10,000 inhabitants.
- The number of Internet users in 1999 is very low, with 2,000-3,000 per country. The number of Internet users per 10,000 population ranges between 195-516 in ECTEL countries compared to the average for Upper-Middle income countries of 461; SKN has 516 users per 10,000 population.
- There is a high percentage of PCs per 100 population compared to other countries of similar income levels (6.5-15.5 per 100 population compared to 2.6 for Lower-Middle and 5.8 for Upper-Middle income countries). SKN is highest at 15.48 PCs per 100 population.
- The relatively high availability of PCs and the comparatively low use of the Internet is likely a direct result of limited access and costs (but mostly costs, since there are a high number of main lines per household across the ECTEL countries).

Network Growth

- Growth in the number of main lines taking place between 1998-1999 in the ECTEL countries is close to the averages for similar income countries, with Dominica and Grenada being slightly less (Dominica's compound annual growth rate (CAGR) is 6.3, and SKN's is 9.2); the average for Upper-Middle income countries is 9.4.
- With the exception of St. Vincent/Grenadines, the growth in Cellular/Mobile for ECTEL countries is well below the growth rates for countries with comparable income levels (43-60 percent compared to 85 percent for Upper-Middle income countries; St. Vincent/Grenadines had an 89 percent growth in 1999 and SKN's growth rate was 59.1 percent).

- Growth in Internet hosts throughout the ECTEL countries is also well below comparable averages, but data is insufficient to make any additional observations.

Identified Areas for Further Pursuit

With respect to “Pipes,” SKN appears to have entered a dynamic environment, with changes from liberalization already evident, particularly in terms of new facilities. However, there is no guarantee that competition will flourish over the long run. Regulation and Government intervention will be needed for some time to come. While liberalization has stimulated capital expenditures, this does not necessarily mean that advanced telecommunications services will automatically follow. Carriers will introduce services only where they perceive an existing or potential demand. In the short-term, it is likely that the market can be served with existing services. In the medium to long run, however, additional services and facilities will be needed if SKN intends to move upstream in terms of informatics development. SKNDB bank officials, for example, are seeking to attract sophisticated informatics businesses like data storage management, which will require more advanced services and well-trained IT workers than currently exist in SKN.

Notwithstanding signs of progress and the promise of more to come as liberalization proceeds, the following are a few “Pipes” issues where additional attention is warranted:

- A. Distributing Competitive Benefits.** The initial benefits of competition are most evident in St. Kitts since it is The Cable’s service area. It is also a larger market than Nevis, where there are few ICT businesses or large business customers other than offshore financial institutions. Declining telecommunications prices will benefit the entire country, but inhabitants of Nevis may not benefit immediately from a choice of voice providers. While it is clear that Nevis would be hard put to support two facilities-based competitors, it may still be possible to develop mechanisms that would ensure that Nevis enjoys all the benefits of a liberalized telecom environment.
- B. Upgraded Mass Media Infrastructure.** Most analysts tend to focus their attention on ICT when they think about infrastructure questions. However, broadcasters are also part of the infrastructure. The broadcast spectrum opens up new opportunities to integrate mass media, ICT, and economic development. At the very least, broadcast spectrum can be valuable for mobile communications, but one can also envision programming built on ICT topics. Greater attention needs to be paid to upgrading the broadcast infrastructure and improved commercial uses of broadcasting to support national goals. The Government television station covers Government meetings and news events six hours per day. Its studio equipment has been described as badly outdated. The station lacks the ability to collect and distribute news electronically. Upgrades could enable the station to provide a video uplink for news, culture and music like the annual music festival. The station, which is also available on cable, adheres to a traditional programming format. Mass media technology should be considered a potential partner for ICT. As with the findings of the other ICT

Assessments, SKN would benefit from a regional capability that would permit sharing of the infrastructure and regional information.

- C. Online Education, Training, and Related Applications.** Enterprise online training has moved into the mainstream and enjoys rapid growth. Several factors are essential to successful training initiatives, including reasonable network prices, an online training infrastructure, and a well-conceived strategy that articulates the goals of training and alternatives to this application. The potential benefits of online education and training are clear and valuable and may overshadow the financial considerations. Online education can occur in real time or delayed to suit the student[s] or client enterprise. The basic infrastructure for online training consists of networked servers that can deliver streaming audio and video. Before undertaking online training initiatives, it is essential to craft an educational strategy that enjoys internal support. Again, a regional capability would benefit more, yet still enable each nation to build its own curricula.
- D. Telemedicine Applications.** Sporadic attempts have been made to apply telecommunications to medical needs, particularly for diagnostic purposes. These experiences were either unsatisfactory or more local medical expertise rendered long-distance consultation unnecessary. As broadband service becomes available and is cheaper and faster, new telemedicine possibilities open up. Before committing substantial funds to this area, it would be advisable to compile a strategic needs assessment report with these two objectives: (1) assess SKN's current health care needs and (2) evaluate responses using telemedicine applications. The report could include an evaluation of the existing IT infrastructure to support new or emerging medical applications. Areas to explore might include (a) electronic medical information systems and information management standards and policy, (b) feasibility of sharing current and future computerized systems, and (c) special network arrangements, such as "public service" licenses. During discussions at the Ministry of Health and at another meeting, it was reported there may be a large room or auditorium at the major hospital facility in Bassterre that could be equipped with advanced multimedia capabilities and features to supplement hospital education and conferencing, and consultations. Ideally, the healthcare assessment report would lead to the formation of a management or steering group to guide the assessment and selection of appropriate telemedicine applications.

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III. Private Sector

Ultimately, it is the private sector that must generate the business activity that establishes and maintains economic growth and improves the living standards of the citizens. This third area of the ICT Assessment focuses on two key areas relative to leveraging ICTs in St. Kitts and Nevis:

- 1) Determining the strength and potential of the ICT-related sector in domestic and international markets, and
- 2) The utilization of ICTs by the local business community in an effort to improve the productivity and efficiency of their operations and, where appropriate, to potentially become more competitive in the regional and global marketplace.

Summary/Analysis

National Economy and Private Sector

Over the past decade, the Federation of St. Kitts and Nevis (SKN) have been reasonably effective at diversifying its economy. SKN has achieved long periods of uninterrupted growth in services (tourism, financial services, etc.) and relative prosperity in light manufacturing and assembly. Notwithstanding negative external economic forces and extensive damage caused by two consecutive hurricanes in 1998 and 1999, levels of inflation, employment, and overall GDP continue to be favorable.

During the years that followed the hurricanes, a world economic slowdown prevented the islands from achieving a full recovery, only to have conditions exacerbated by the September 11 terrorism attacks and the overall downturn in the tourism industry. GDP growth dropped five percentage points in the first year of the new millennium when compared to pre-hurricane growth but still remained positive.

Economic recovery should resume with (1) the construction of several large tourism projects and new tourism product development and (2) the redirection of foreign investment strategies towards more near-term and low-risk opportunities in information technology areas. SKN will also realize investment benefits as a result of the legal/regulatory changes that resulted in the country's removal from the OECD Financial Action Task Force (FATF) blacklist.¹⁰

Since its appearance on the OECD's list of uncooperative tax regimes in early 2001 and its subsequent removal in the first quarter of 2002, SKN has demonstrated a commitment to fair

¹⁰ *FATF Annual Report for 2001-2002 released*, Organization for Economic Cooperation and Development, <http://www.oecd.org/EN/document/0,,EN-document-590-17-no-12-31431-590,00.html>.

banking practices. This led to the creation of the Financial Intelligence Unit to facilitate investigations of suspected tax avoidance as well as to enforce a transparency mechanism, which was recently added to the Companies Act.

The Prime Minister has emphasized the advantages of ready-to-work commercial structures for targeted ICT FDI, and a related proposal is part of his draft Action Plan. The Prime Minister has stressed the importance of equipping commercial space as part of an overall strategy to attract ICT investment. Called “smart” buildings, they play on the notion that “intelligent” jobs are found there.

ICTs and the Private Sector

SKN’s political and business leadership have shown enthusiasm about the opportunity of injecting ICTs into their economy. While disparate resources have led to somewhat uneven ICT results, several instances of private sector utilization of ICTs indicate they are being effectively leveraged. The Ocean Terrace Inn, for example, illustrates how ICTs are leveraged at a major 80 room local hotel. Utilizing a few first generation Pentium computers (and one 386Mhz for the unlucky guest), the hotel can still manage multiple ICT tasks such as tracking reservations, automated billing, processing online reservations, administering the payroll, etc., using only off-the-shelf software.

To the extent that small and medium-sized enterprises (SMEs) in SKN use ICTs, it is generally restricted to word processing, spreadsheets, and other administrative functions with little use of customized software applications or complex networks (e.g., multi-platform LANs). Occupying the high-value end of ICT utilization, the SKN Call Center facility is in the process of installing a LAN scaleable to 150 ports and software capable of supporting an advanced call center system. ICT activity in SKN is episodic and, therefore, difficult to evaluate relative to its productive value. Assessing ICT’s economic significance in key industry sectors is probably a more useful approach. These sectors are: (1) offshore financial services, (2) outsourced and value-added network enterprises, and (3) tourism-related transactions and communications.

Offshore financial services are a measurable international force in some offshore markets, with various analysts estimating their share of the world’s hard currency to be as high as forty to fifty percent. In terms of ICTs, offshore financial jurisdictions acquired much of their capabilities and achievements because of the early advantages offered by telecommunications. They rely increasingly on more advanced telecom innovations to improve their competitiveness.

SKN, particularly Nevis, is regarded very favorably as a smaller, but able, offshore jurisdiction, and has benefited from the growing number of offshore financial transactions. The country ranks high among offshore International Financial Centers (IFCs) for their flexible and affordable requirements regarding corporate registration. An IFC is typically described as a foreign financial jurisdiction with favorable tax controls. For example, the IFC in SKN began with the enactment in 1984 of the Nevis Business Corporation Ordinance, followed by provisions in that expanded international coverage of trusts, International Business Corporations, limited Liability Companies (LLCs), and Offshore Banks. These incentives have attracted thousands of

International Business Corporations (IBCs) and, in turn, require a considerable network of professional support and administrative services that depend on ICTs to manage business communications, essential correspondence, and financial transactions. Expansion in the number and variety of IBCs has led to the utilization and deployment of advanced ICTs in SKN, especially to manage client services. Among the technologies available to manage online accounts are interactive asset management tools and brokerage services. These tools have sophisticated features, providing complete “Virtual Headquarters” built around sophisticated technical components, secure software applications, and aggressive investment strategies.

Also central to the offshore sector is the role of the Office of the Registrar, which administers legal trusts and also controls access to private corporate and personal data provided in registration filings. Only twenty “agents” are currently authorized to file corporate registrations and the law requires a witnessed signature. Other jurisdictions are turning to online registration of trusts, but only St. Lucia claims to provide a “total” online solution to corporate registration procedures.

The second sector, outsourced and value-added network enterprises, consists of (1) operations whose revenues are derived from selling ICT products and services, and (2) ICT firms that are heavily reliant on ICTs for their core business operations. An example of the latter is online gambling. The number of SKN operators has fluctuated between four and eight companies, but their revenues can be substantial. Internet gambling is one of the few profitable online industries. A properly organized and managed gambling business can yield substantial benefits to the host economy, and, simultaneously strengthen its ICT infrastructure. Neighboring Antigua has generated Government revenue amounting to US\$25M in license fees.

Internet gambling operations in SKN were accompanied by ICT financial systems, specifically online payment processing systems, or PPS. The financial needs of high-volume online gambling merchants are markedly dissimilar from those of IFC institutions. There are signs that SKN commercial banks are attempting to develop modern banking practices that will better address the needs of online gaming merchants.

Other firms in this second group are the ICT network-centered businesses that provide various services and operational support to other ICT vendors. Despite its small size, SKN has relatively sizable ICT resources and skills. Specialized services available in Basseterre ranged from Web hosting and Web site development, collocation, database development and maintenance, credit card processing, graphic design, marketing and consulting, and some software development. Net.kn and Moonflies.com are a couple of local companies that believe there has been a steady, but not spectacular, growth in the local ICT community. Returning expatriates with adequate IT skills are in high demand in the SKN market and have enhanced the growth of ICTs. Some Government officials in the SKN Development Bank would like to attract advanced ICT businesses like SANS (storage area networks) to SKN, even though the country lacks the IT personnel to maintain such businesses at this time.

Tourism is the third business sector that makes significant use of ICTs. It has managed to maintain a degree of stability, despite nearly US\$500 million dollars in damage from the 1998 hurricane, the U.S. recession, and the negative effects of September 11 (due to a downturn in American travel overseas). Investment in, and construction of, new tourism facilities has resumed. New developments include the 471-room Marriott Royal scheduled for a 2003 opening and the Paradise Beach Resort and Casino at Frigate Bay, both on St. Kitts. In addition, a US\$4.4 million World Bank aid package was released in the first quarter 2002 for tourism infrastructure improvements. Other ongoing funding sources include the Organization of American States' (OAS) Small Tourism Enterprise Program (STEP), with a focus on technology training for small hotels. The OAS has been able to deliver into the region specialists who have assisted more than 300 small hotels with their technology needs. The SKN Hotel Association is also very active in the industry. The Association's Director mentioned two conflicting near-term considerations for the industry: (1) the possibility of developing a national or Caribbean-wide hotel Computer Reservation System (CRS), and (2) the immediate and serious shortage of skilled labor in IT professional services.

As of this writing, SKN officials have started outlining a draft ICT Action Plan that alludes to specific private sector activities. Among the suggestions are the following: (1) expand human resources capacity by making greater use of existing computer labs for life-long learning solutions (some labs will require upgrades); (2) the C.F. Bryant College computer labs should be given special enhancements to meet requirements for degrees in intermediate software development and to prepare network engineers for job openings anticipated in outsourcing; (3) establish software certification programs that will support a larger ICT vision for indigenous companies to develop software production capabilities; (4) sponsor trade associations for all ICT companies to provide information resources and greater industry integration; and (5) lower interest rates on development loans for ICT FDI, even though the Development Bank and FND have exhausted their capital resources.

Identified Areas for Further Pursuit

A. Public and Private National Online Gateway. A comprehensive national Web portal that represents both public and private communities can offer a "cross-merchandising" advantage in addition to functioning as a marketing tool for building awareness of SKN local commercial strengths. The tourism industry is ideally suited for a national portal system. Smaller countries can enjoy economies of scale associated with broad-based portal development. That is, the fewer enterprises, the easier and more economical it is to "package" a mix of demand-driven public/private content sections. National portals can also convey a national identity that presents the country as accessible, modern, and responsive to changing conditions in commercial activity. Over time, an integrated public/private portal can improve accountability, openness, inclusiveness, and efficiency. For immediate purposes, however, the value of the portal concept is to stimulate innovative marketing and to extend linkages to

other sectors using ICT. This concept could also be developed on a regional level that would promote a Caribbean branding of its strong industry sectors.

- B. Develop ICT Capabilities for the Caribbean Music Community.** The music industry in the Caribbean is substantial and is a prevailing cultural influence. Music festivals assume an important role in the economy and everyday life. Moreover, with recent market data showing Cuban, Caribbean and Latin music as some of the fastest growing sectors in the music industry, there appear to be market opportunities for exploiting ICTs in further developing the industry. Beyond its proven distribution advantages, ICTs could also enable the Caribbean to establish itself as an alternative market for Caribbean, U.S., and European musicians. For years, however, the music industry in the Caribbean has been plagued by problems of institutional capacity, human resource development, income generation, and intellectual property rights violations. In order for an alternative Caribbean market to gain credibility, the public and private sectors will have to work together to address these lingering issues.

The music industry needs technical assistance to explore online alternatives or initiatives for production, promotion, and distribution of music produced by local artists. Initial efforts might also experiment with using satellite, radio, and the Internet to target regional markets, build on existing industry relationships, and test innovative network distribution services, such as compressed programming products and distance studio or professional music services. Market awareness of Caribbean music may be raised by featuring music programs and samples on a regional portal. A key component is an integrated Web site for public dissemination that, in turn, could be linked to the national site. NBC Radio of SKN is the local broadcasting facility which offers local news, weather, sports, programming guide and the very popular “audio center” through its Web site. The site makes a compelling case for ICT-assisted music and community development.

- C. Expand Offshore Operations.** The increase in offshore outsourced services in the Caribbean is reducing unemployment and indicating promise as a long-term industry. Offshore ICT companies are typically used to support domestic and multinational corporations and institutions, primarily in the financial, insurance, telecommunications, healthcare, information technology, media and hospitality industries. The market is estimated to grow 20 percent annually with the potential to generate significant employment, ranging from 200 to 800 employees per center in some cases. However, the future growth prospects of these service areas depend on the success of present efforts to liberalize telecommunications. SKN is in a good position for further development of ICT businesses due to its English speaking population, 90 percent literacy rate, low labor costs, location proximate to the Eastern time zone, preparations for adult education programs in related ICT course work, and recent experience in building the SKN Call Center. Discussions are underway for a call center in Nevis. These initiatives could be advanced through expert technical assistance.

- D. Coordinated Online Tourism Initiatives.** There are a number of competing interests in SKN with respect to online initiatives. The SKN Hotel Association, for example intends to maintain its own SKN portal and possibly develop its own online

reservation system. Given SKN's small size, it may be more efficient and economical to coordinate online resources under a national or regional "official" tourism Web site. Multiple portals are certain to confuse potential customers.

- E. ICT-related Training and Technical Assistance for the Banking/Investment Sector.** In an effort to at least partially resolve the issue of lack of capital for ICT-related firms, there is a need to provide training and technical assistance to the local banking sector. The financial industry needs to better understand the nature of ICT businesses and how to help them grow with adequate financial support and expert assistance. ICT-related firms are frequently service oriented, without a lot of capital investments, thus they do have much with which to "secure" loans. At present (as in all the islands) the local banks do not have "comfort factor" with ICT firms, and this needs to be corrected. While ultimately, FDI will be needed for larger projects, there is a modest level of domestic direct investment available. Efforts should be made, however, to ensure foreign investors are not unduly favored over domestic entrepreneurs.

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IV. People

The widespread deployment and utilization of ICTs is directly dependent upon the ability of a population to become ICT proficient. Whereas the public sector can set ICT strategy and policy, and the private sector can bring together opportunities and needed financial resources, both are dependent upon the intellectual capital of a nation and the ability of its people to provide the requisite skills and human capabilities. In the end, the ultimate change agent is a nation's citizens.

This section explores the intellectual resources of the people of St. Kitts/Nevis, their educational background, their capabilities and potential from an ICT-related perspective, and their desire and willingness to develop an ICT industry sector and use ICTs. There are a few countries that serve as development models of success and useful case studies for countries to emulate. Ireland and India are two of the more prominent. Ireland used about a third of its EU infusion money to develop education and human resources that in turn developed knowledge industries, like IT.¹¹ This section examines St. Kitts and Nevis's school systems, private training institutions, and employer training initiatives that are each in their own way critical to supporting the country's potential for increased utilization of ICTs.

Summary/Analysis

One of the major constraints to the growth of the ICT sector in SKN has been the lack of a skilled labor force. The availability of appropriate skills is a major concern of the Government, SMEs, and educational institutions. The Government of SKN has launched a number of initiatives to address this issue, but time lags may mean that the shortage of trained labor will act as a constraint to growth and productivity improvements in the short- to medium-term. Interviews were replete with suggested difficulties that firms encounter, ranging from getting IT service professionals to trouble-shoot basic PC problems to finding and retaining systems administrators. For educators, retaining good IT faculty and identifying the appropriate ICT curriculum components are difficult because of the demand for qualified professionals in this field. This shortage of ICT personnel is exacerbated by limited public sector funding.

SKN's labor sector competitiveness has eroded somewhat in the last few years as wages have risen faster than in most countries in the region. The labor force numbers about 22,000 workers. As for ICT professionals, a SKN private sector manager estimates that salaries for ICT network professionals are roughly half of the U.S. level. Mandated holiday time is two weeks, and contributions are required for retirement, health benefits and the Severance Payment Fund.

The SKN Government is the main provider of the basic education. It has invested significant resources into outfitting primary and secondary schools with computers and Internet

¹¹ *Business Central Europe*, September 2000, p. 19.

connectivity. All secondary schools have computer laboratories, while primary schools are in the final stages of investing over US\$1 million to computerize their facilities. The focus at the lower levels is to complement traditional teaching methods, such as aiding instruction in core subjects, including English and mathematics, with ICTs. Work is underway to equip the public libraries in Basseterre, Sandy Point, and Cayon with networked computers. IBM was the primary vendor for installing the computers and local network facilities, and C&W recently extended “free” Internet connection to all public schools. It is unclear whether the local operating C&W subsidiary will follow the policy of their affiliate operating company in St. Vincent and Grenadines whereby Internet access is free only for an allotted amount of time, after which an hourly rate is applied.

Educational officials are also evaluating different distance learning systems with the help of a consultant. The teachers and administrators have agreed to adopt the Alexandria Digital Library Project and its accompanying standard, Alexandria Digital Library (ADL), as an online library platform. This “working digital library” is a distributed computing search tool that uses geographically-referenced materials and collections originating from various academic institutions, private companies, and Government agencies. Also under consideration within the OECS are network options involving alternative cable facilities and a wireless wide area network (WAN).

The private sector has played a significant role in educational reform by offering various forms of assistance to the public education system. As part of their services to the schools, IBM has donated equipment and technical assistance and, more recently, has hosted conferences and consultations with Ministries to help them map out an e-government strategy. With respect to school wiring, one IBM manager commented how remarkable the SKN community is in their efficiency and determination to complete the computer installation process. He remarked on the enterprising manner that is characteristic of the people of SKN and, based on his experience, expects their approach to e-government services to also be successful.

St. Kitts and Nevis, like all of the Caribbean islands, have made job creation one of their primary goals, with education considered critically important to achieving it. The current education and training strategy follows the principles set forth by the Ministry of Education, Labour and Social Security in the 1996 Budget, which are to guide and deliver education at all levels, abilities, and ages and to tailor education to generate concrete results for the economy. A recent example involves the use of computer technology as a teaching aid for specific subjects and the preparation of lesson plans. Computers are also used at the local Multi Purpose Center located at the main community college campus to prepare students to work in hospitality and general administrative services, including typing and word processing.

SKN public officials – together with private sector stakeholders -- are also addressing some of the economic inequities and social problems in the labor market. Computer facilities at the schools are being prepared for use during after-school hours to make available computer training for adults as part of the Rural Adult Education Program (RAEP). The first phase of the program cost just under US\$10,000 and was completed in February 2002. Already, 179 individuals completed courses ranging from basic computer appreciation, disaster preparedness, and small business management to hospitality training. Out of 152 original enrollees who

completed the computer program, only 21 were males. This gender gap illustrates a widespread problem that extends into many of the service sectors and professional fields. Public officials are especially anxious about whether enough males in the community will be adequately trained to fill the higher-skill requirements anticipated with the new 400 room Marriott opening in 2003 and the other multi-level ICT opportunities that become available.

If the deficit in local male job applicants continues, it could present an embarrassing situation for the Government if it is forced to pass over unqualified local males and issue work permits to foreign candidates. Work permits are required for foreign workers and are typically intended for persons with higher-level skills not readily available in SKN. The Government estimates it takes about a month to process the application while others report a wait as long as five months.

Other technical training needs are met largely by the Clarence Fitzroy Bryant College (CFB), which offers courses in plumbing, secretarial skills, basic hotel administration, and electrical and mechanical engineering. The Government is proposing the creation of a new Computer Training Technology Unit at the CFB for full and part-time students aimed at developing a stable of young persons to work in ICT industry sector. The types of training envisioned range from fundamental computer technology to job-specific training and specialized high-end support services. The College may also provide accelerated training in software development, e-commerce, and other Internet-related applications. The main campus has two computer labs, each with fifteen terminals connected by Ethernet and with 56 kbps dial-up Internet access. The College receives forty hours of line usage per month from C&W at an average charge of EC\$1000.

The unofficial ICT Action Plan now being circulated among SKN officials is in keeping with their tradition of results-focused learning. Under the SKN Government's leadership, and in close partnership with all essential sectors, a set of action items is being developed to address human resources concerns that include training certificates in basic software development, network administration, and data processing. The CFB would be expanded and equipped with the necessary hardware and software to support a "Parametric Testing Center" by the year 2004.

Identified Areas for Further Pursuit

- A. After-School Multimedia Workshops**—Given the unfavorable computer-to-student ratio and limited Internet access in secondary schools, SKN might consider new ways of maximizing their ICT resources, including their use in smaller class settings. For instance, students who are over-achievers or who have an interest in supplementing their learning in a multimedia environment could participate in after-school "digital clubs" consisting of regularly scheduled interactive workshops that employ a variety of multimedia equipment – networked computers, audio/visual, broadcasting, and so on. The aim would be to engage students in a discussion on topics not necessarily covered in the curriculum: anthropology, astrology, language, art, music, as well as online interactive learning games and simulations, such as re-created NASA space

explorations or a virtual “time-machine” that allows students to role-play in scenarios, such as “one day in the life of an Aztec Indian,” and so on.

B. Explore Creating a Private Sector “Floating Skill Pool” of ICT Technicians.

A public-private partnership that would serve as a “floating skill pool” of ICT technicians could help address the current deficit of IT technicians. This problem was presented in all discussion as “urgent” to the business community, whose networks, in many instances, were being neglected beyond seven to ten business days. The Government’s role would be to support the project as an initial “angel” investor and guarantor. Unlike traditional models in network management, in which staff are hired on a full-time basis to oversee tasks that typically arise intermittently, this partnership could distribute resources economically to the needs of multiple clients, but from a single “pool” of professional IT technicians. Especially for SMEs, this structure enables professionals to be made available at “affordable” rates. Professionals’ fees are set to cover operating expenses and capital expenditures. The Government would act as an anchor customer and supporter until independent market realization is achieved.

C. ICT Awareness Training for Local Firms. While there is an increasing use of ICTs in local businesses, for the most part, this use is limited to back-office processes such as word processing, accounting, etc. It is not readily apparent that ICTs are incorporated into core business processes. In part, this is due to a lack of awareness by traditional businesses regarding the value of ICTs. Awareness training could be carried out through the Chamber of Commerce with a series of presentations shaped for various industry sectors. The key focus would be on making firms aware of how ICTs can be more effectively leveraged in their businesses to gain competitive advantages by lower costs, streamlining processes, etc.

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Appendix A – Digital Economy 2000

On June 5, 2000, the U.S. Department of Commerce (DOC) issued its third annual report on the information technology revolution and its impact on the U.S. economy, titled "Digital Economy 2000."¹² This series of reports has been critical to providing a more comprehensive understanding on the direct and indirect role/impact of the information technology (IT) sector within the U.S. In introducing the report, then-Vice President Gore presented several key highlights from the report:

- IT accounts for half or more of the gains in U.S. productivity since 1995. The U.S. enjoyed a 2.8 percent productivity growth from 1995 to 1999--double the 1.4 percent rate of 1973 to 1995. Improved productivity has lowered inflation and raised real wages.
- IT is lowering inflation. Falling IT prices have directly pulled down overall average inflation by 0.5 percentage points a year. In addition, by raising productivity, IT lowered inflation of other industry sectors.
- The IT sector is rapidly creating jobs at high wages. IT jobs average \$58,000 a year, 85 percent higher than the average for the private sector. Between 1994 and 1998, employment in IT industries expanded by 30 percent, from 4.0 million to 5.2 million jobs. IT occupations that pay the best and require the most education have been growing most rapidly.

Former Secretary of Commerce, William M. Daly, writes in the Report's preface:

"What we can see clearly are expanding opportunities. To meet these opportunities, we will have to ensure a stable and conducive economic and legal environment for continuing innovation in information technology and e-commerce. We need to encourage the building of a broadband infrastructure that allows all Americans to have access to the advanced services that support the Internet, and take the steps necessary with respect to privacy, consumer protection, security, reliability, and intellectual property rights that will inspire confidence in the Internet. To realize the full potential of this digital economy, every person and every business must be able to participate fully and make their own unique contribution to its development."

The Executive Summary of the Report provides a strong message regarding the impact of ICTs on the U.S. economy. In addition to the above highlights, these include:

¹² *Digital Economy 2000*, U.S. Department of Commerce, <http://www.esa.doc.gov/de2k2.htm>.

- The Internet in particular is helping to level the playing field among large and small firms in business-to-business e-commerce.
- There is growing evidence that firms are moving their supply networks and sales channels online and participating in the new online marketplaces.
- Advances in information technologies and the spread of the Internet are also providing significant benefits to individuals.
- The vitality of the digital economy is grounded in the IT-producing industries--the firms that supply the goods and services that support IT-enabled business processes, the Internet, and e-commerce.
- Although IT industries still account for a relatively small share of the economy's total output--an estimated 8.3 percent in 2000--they contributed nearly a third of real U.S. economic growth between 1995 and 1999.
- IT industries have also been a major source of new R&D investments.
- New investments in IT are helping to generate higher rates of U.S. labor productivity growth.
- Growth in the IT workforce accelerated in the mid-1990s, with the most rapid increases coming in industries and job categories associated with the development and use of IT applications.
- Analysis of the computer and communications industries in particular suggest that the pace of technological innovation and rapidly falling prices should continue well into the future.
- Businesses outside the IT sector almost daily announce IT-based organizational and operating changes that reflect their solid confidence in the benefit of further substantial investments in IT goods and services.

While the above reflects dynamics taking place in the U.S. economy relative to the ICT sector and its broader impact on the economy, it also reflects the potential value of ICTs in other economies--including developing and transitioning economies. This is of specific relevance the OECS/ECTEL countries as they seek to grow their economies, not so much by their reliance on traditional agricultural and tourism base, but by expanding their reliance on ICTs for growing their service, information, and knowledge-based sectors.

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Appendix B – 1999 ITU Statistics

Each year, the International Telecommunications Union (ITU) publishes a *World Telecommunications Development Report*¹³ that provides statistical data for all countries. Its March 2001 report included an expanded set of data that, for the first time, included data on mobile cellular. In addition to this worldwide report, the ITU periodically publishes regional-specific reports with more detailed discussions on a given geographical region. In April 2000, an *Americas Telecommunications Indicators 2000* report was published.¹⁴

The ITU-compiled data serves as rich resource material for understanding the dynamics taking place in telecommunications. While there are several acknowledged weaknesses in the reports (such as timing, accuracy, and incompleteness), they are still the best set of normalized data whereby trends can be identified and macro-level regional/country comparisons made.

For purposes of this ICT Assessment, selective 1999 data (the most recent available from the ITU) has been extracted from the *World Telecommunications Development Report 2000-2001* for the ECTEL countries and a few other Caribbean Islands (Barbados, Jamaica, and Trinidad/Tobago), along with selected income-level data. Combined, this data provides a quick snapshot of the current telecommunications situation in the ECTEL countries, including St. Kitts and Nevis (SKN).

The following tables provide more details of the situation in SKN. Following each table are keynotes clarifying some of the data on the tables, as well as short comments with respect to what one may conclude from the data.

¹³ *World Telecommunications Development Report 2000-2001-- World Telecommunications Indicators*, ITU, Geneva, March 2001.

¹⁴ *Americas Telecommunications Indicators 2000*, ITU, Geneva, April 2000.

Basic Indicators

Country	Population - 1999		GDP – 1998		Main Phone Lines	
	Total (Millions)	Density (per km)	Total (US\$ B)	Per Capita (US\$)	Totals (000s)	Teledensity (per 100)
ECTEL Countries						
Dominica (U-M)	0.08	102	0.3	3,391	21.3	27.88
Grenada (U-M)	0.09	271	0.3	3,635	29.4	31.51
St. Kitts/Nevis (U-M)	0.04	148	0.3	6,840	20.1	51.76
St. Lucia (U-M)	0.15	250	0.6	3,815	44.5	28.93
St. Vincent/Gr (L-M)	0.11	291	0.3	2,395	23.6	20.88
Barbados (U-M)	0.27	626	2.3	8,731	115.0	42.71
Jamaica (L-M)	2.56	224	6.9	2,707	509.6	19.91
Trinidad/Tobago (U-M)	1.29	252	6.1	4,726	278.9	21.58
Lower-Middle Income Total/Avg.	861.83	24	1,341.0	1,621	103,294.4	11.99
Upper-Middle Income Tot/Avg.	634.96	27	2,945.1	4,705	126,649.4	19.95
High Income Tot/Avg.	891.52	26	23,263.6	26,288	521,516.1	58.50
Americas Tot/Avg.	814.62	20	11,413.4	14,207	271,006.1	33.27
WORLD	5,980.91	44	29,686.5	5,111	906,713.6	15.16

NOTES:

1. Calculations for GDP vary considerably based on source and calculations used. Here, GDP figures are presented utilizing ITU's methodology and normalized across all countries in a consistent manner.
2. Teledensity is the number of phones per 100 inhabitants.

Observations:

- The populations of the ECTEL islands are small (typically less than 100,000), but relatively concentrated (with between 100 to nearly 300 people per square kilometer), due to the small size of the islands; Grenada has 271 people per square kilometer. St. Kitts occupies 168 square kilometers, while Nevis occupies 93 square kilometers.
- The economies of the ECTEL islands are relatively small (between US\$300-600 million annual GDP), but on a per capita basis, they are relatively high (between US\$2,400-6,000 per capita GDP), placing most ECTEL countries in what is considered the Upper-Middle income band. SKN's GDP is US\$300 million, but with a high GDP per capita of US\$6,840, compared with the highest ECTEL country, St. Lucia, which as a GDP per capita of US\$3,815.
- Relative to the world average for Upper-Middle income countries, the ECTEL countries have a higher than average teledensity (ranging from 28-52 whereas the average is 20); SKN's teledensity is the highest of all ECTEL countries at 51.76%. St. Vincent/Grenadines is a Lower-Middle income country, but here too, it is above the average of similar countries (teledensity of 21 versus an average of 12).

Main Telephone Lines

Country	Main Telephone Lines			Teledensity		
	1995 (000)	1999 (000)	CAGR % 1995- 1999	1995	1999	CAGR % 1995-1999
ECTEL Countries						
Dominica (U-M)	17.8	21.3	4.6	24.13	27.88	3.7
Grenada (U-M)	23.2	29.4	6.1	26.02	31.51	4.9
St. Kitts/Nevis (U-M)	14.4	20.1	8.6	36.32	51.76	9.3
St. Lucia (U-M)	30.6	44.5	9.8	21.02	28.93	8.3
St. Vincent/Gr (L-M)	18.2	23.6	6.7	16.46	20.88	6.1
Barbados (U-M)	90.1	115.0	6.3	34.53	42.71	5.5
Jamaica (L-M)	291.8	509.6	15.0	11.67	19.91	14.3
Trinidad/Tobago (U-M)	209.3	278.9	7.4	16.78	21.58	6.5
Lower-Middle Income Total/Avg.	76,081.5	103,294.4	7.9	9.94	11.99	6.7
Upper-Middle Income Tot/Avg.	89,505.5	126,649.6	9.1	14.90	19.95	7.6
High Income Tot/Avg.	460,053.5	521,516.1	3.2	52.81	58.50	2.6
Americas	221,402.5	271,006.1	5.2	28.71	33.27	3.7
WORLD	691,601.0	906,713.6	7.0	12.15	15.16	5.7

NOTES:

1. CAGR = Compound Annual Growth Rate

Observations:

- With the exception of St. Kitts/Nevis and St. Lucia, growth in main lines and teledensity between 1995 and 1999 is less than the world averages for similar income level countries; Grenada's compound annual growth rate (CAGR) in main lines was 6.1 percent compared to 9.1 percent for Upper-Middle income countries, but close to the world average CAGR of 7.0 percent. SKN's growth in main lines was 8.6 percent, and its growth in teledensity was 9.3 percent – the highest of any ECTEL country.

Local Telephone Network

Country	Main Telephone Lines – 1999				Faults per 100 Main Lines/year 1999
	Capacity Used (%)	Automatic	Digital (%)	Residential (%)	
ECTEL Countries					
Dominica (U-M)	61.1	100.0	100.0	85.0	9.0
Grenada (U-M)	83.0	100.0	100.0	81.0	1.1
St. Kitts/Nevis (U-M)	---	100.0	100.0	77.0	---
St. Lucia (U-M)	---	100.0	100.0	76.0	---
St. Vincent/Gr (L-M)	61.6	100.0	100.0	78.0	9.4
Barbados (U-M)	---	100.0	100.0	67.0	---
Jamaica (L-M)	---	100.0	100.0	---	---
Trinidad/Tobago (U-M)	72.1	100.0	100.0	82.3	75.0
Lower-Middle Income Total/Avg.	82.5	99.2	51.7	79.0	31.9
Upper-Middle Income Tot/Avg.	84.4	99.5	84.2	75.3	19.8
High Income Tot/Avg.	89.5	100.0	95.9	69.6	10.6
Americas	87.8	99.8	91.9	67.8	14.1
WORLD	81.4	99.8	89.6	73.1	24.8

NOTES:

Observations:

- Used switching capacity across all the ECTEL countries is 61-83 percent (Grenada is 83 percent). The world average is 81.4 percent and the average for Upper-Middle income countries is 84.4 percent. Dominica and St. Vincent/Grenadines fall significantly below this rate, with only about 61 percent of switching capacity used. Figures were not available for SKN.
- All the switching capacity for the main telephone lines is 100 percent automatic and digital.
- The percentage of main telephone lines that are residential is higher than countries with comparable income levels (76-85 percent versus an average of 75 percent for Upper-Middle income countries). Seventy-seven percent of SKN's lines are residential.
- While the data is not available for all ECTEL countries, the faults per 100 main lines appears significantly less than other Lower-Middle and Upper-Middle income countries (no doubt due in part to digital switching and a more concentrated user base). Grenada has only 1.1 faults per 100 main lines per year, compared to an average of 19.8 for Upper-Middle income countries. Figures were not available for SKN.

Teleaccessibility – 1999

Country	Residential Main Lines		Public Telephones		
	Total (000s)	Per 100 Households	Total (000s)	Per 1000 Inhabitants	As % of Main lines
ECTEL Countries					
Dominica (U-M)	15.9	77.5	0.31	4.20	1.67
Grenada (U-M)	23.8	76.9	0.20	2.17	0.69
St. Kitts/Nevis (U-M)	12.0	>100.0	0.17	4.23	1.07
St. Lucia (U-M)	30.7	69.7	0.42	2.88	1.26
St. Vincent/Gr (L-M)	18.4	73.7	0.21	1.87	0.90
Barbados (U-M)	77.0	81.1	0.87	2.13	0.50
Jamaica (L-M)	---	---	2.07	0.82	0.59
Trinidad/Tobago (U-M)	229.5	66.5	2.15	1.66	0.77
Lower-Middle Income Total/Avg.	76,538.6	38.3	943.04	1.15	0.93
Upper-Middle Income Tot/Avg.	93,147.3	58.5	2,662.24	4.22	2.13
High Income Tot/Avg.	348,714.4	106.1	4,282.43	4.85	0.83
Americas	182,027.6	78.5	3,644.01	4.54	1.35
WORLD	618,042.5	51.2	11,577.02	2.02	1.31

Observations:

- The percentage of households with phones throughout the ECTEL countries is considerably higher than the world averages for the Lower-Middle and Upper-Middle income countries (70->100 percent compared to 38-58 percent; SKN has >100 percent residential main lines per 100 households).
- The ECTEL countries' number of public telephones per 1000 inhabitants is quite close to the world average for their respective income level, however, as a percentage of main telephone lines, they are somewhat lower than the world average (likely due to the high level of phone lines that exist in households). SKN has 4.23 public telephones per 1000 inhabitants compared to an Upper-Middle income average of 4.22.

Largest City Main Lines – 1999

Country	Largest City			Teledensity	Rest Of Country	Overall Country Teledensity
	Population as % of Total	Main Lines				
		(000s)	% of Total			
ECTEL Countries						
Dominica (U-M)	13.5	7.4	39.5	82.22	17.37	25.23
Grenada (U-M)	21.4	10.7	36.2	53.30	25.58	31.51
St. Kitts/Nevis (U-M)	54.2	---	---	---	---	---
St. Lucia (U-M)	35.2	---	---	---	---	---
St. Vincent/Gr (L-M)	14.3	4.3	18.0	26.28	19.98	20.88
Barbados (U-M)	43.0	---	---	---	---	---
Jamaica (L-M)	29.7	---	---	---	---	---
Trinidad/Tobago (U-M)	26.0	6.27.2	24.1	19.95	22.15	21.58
Lower-Middle Income Total/Avg.	13.2	26,618.2	27.3	25.06	9.17	11.71
Upper-Middle Income Tot/Avg.	16.0	27,558.3	24.9	27.87	16.15	18.04
High Income Tot/Avg.	10.4	29,676.1	15.2	60.97	52.23	53.40
Americas	13.4	17,537.8	33.1	20.01	9.29	11.29
WORLD	7.8	96,758.1	18.1	24.56	9.00	10.16

NOTES:

Observations:

- With the exception of Dominica and St. Vincent/Grenadines, the percentage of the population of the ECTEL countries living in the largest city is considerably higher than comparable income level countries, but likely consistent with small island nations. SKN has 54.2 percent of its population living in its largest city.
- Teledensity of the largest ECTEL cities appears to be quite high (53-82 compared to 28 for Upper-Middle income countries) but, again, this is likely due to the nature of island nations. However, some data is missing for several of the islands. Grenada's largest city teledensity is 53.3 compared to an average of 27.87 for Upper-Middle income countries. Data was not available for SKN.
- There is a significant disparity between the teledensity of the largest city and the rest of the country (e.g., for Dominica, the largest city which contains only 13.5 percent of country's population has a teledensity of 82.22, whereas the rest of the country has a teledensity of 17.37). This is an extreme situation, but reflects the disparity, even though in most cases this is not as exaggerated. Grenada's teledensity for its largest city is 53.3 compared to an overall country teledensity of 31.51. Figures were not available for SKN.

Telephone Tariffs - 1999

Country	Residential (US\$)		Business (US\$)		Local Calls US\$	% GDP per Capita
	Connection	Monthly Subscription	Connection	Monthly Subscription		
ECTEL Countries						
Dominica (U-M)	20	2.7	20	7.5	---	1.0
Grenada (U-M)	85	14.1	85	40.7	---	4.6
St. Kitts/Nevis (U-M)	2	3.0	27	3.7	0.02	0.6
St. Lucia (U-M)	---	---	---	---	---	---
St. Vincent/Gr (L-M)	37	6.3	37	14.8	0.09	3.2
Barbados (U-M)	49	15.5	49	42.4	---	2.1
Jamaica (L-M)	16	2.7	23	5.8	0.06	1.5
Trinidad/Tobago (U-M)	11	4.6	22	27.8	0.04	1.2
Lower-Middle Income Total/Avg.	107	4.0	163	7.6	0.05	3.5
Upper-Middle Income Tot/Avg.	82	8.1	129	15.6	0.07	1.8
High Income Tot/Avg.	106	11.5	116	16.6	0.10	0.7
Americas	100	7.9	134	16.3	0.06	3.3
WORLD	94	6.5	128	10.4	0.08	5.6

NOTES:

- The % GDP per capita column is the subscription cost as a percentage of GDP per capita and is calculated based on 1998 GDP and population data.

Observations:

- Connection rates for linking up telephone service are typically less in ECTEL countries than in countries with similar income levels (for both residential and businesses). For Grenada, the costs are close to the world average for Upper-Middle income countries (US\$85 for both residential and business compared to average of US\$82 and US\$129). SKN's connection rates are quite low at US\$2 for residential connection and US\$27 for business.
- Monthly subscription costs for SKN are considerably lower than the average for Upper-Middle income countries (for residential, US\$3 compared to US\$8.10; and for business, US\$3.70 compared to US\$15.60). It should be noted that this is 1999 data.
- SKN's Telephone Tariffs as a percentage of GDP are very low compared to other Upper-Middle income countries (0.6 percent compared to an average of 1.8 percent).

Cellular Subscribers

Country	Cellular Mobile Subscribers					As % of Total Telephone
	Subscribers (000s)		CAGR % 1995- 1999	Teledensity 1999	% Digital 1999	
	1995	1999				
ECTEL Countries						
Dominica (U-M)	---	0.7	---	0.86	100.0	3.1
Grenada (U-M)	0.4	2.0	49.8	2.15	---	6.4
St. Kitts/Nevis (U-M)	---	0.7	---	1.81	---	3.4
St. Lucia (U-M)	1.0	1.9	23.9	1.25	---	4.5
St. Vincent/Gr (L-M)	0.2	1.4	60.3	1.25	7.0	5.7
Barbados (U-M)	4.6	30.0	59.7	11.14	90.0	20.7
Jamaica (L-M)	45.2	144.4	33.7	5.64	---	22.1
Trinidad/Tobago (U-M)	6.4	38.7	57.1	2.99	---	12.2
Lower-Middle Income Total/Avg.	2,719.3	19,670.2	64.0	2.28	25.6	16.0
Upper-Middle Income Tot/Avg.	7,526.5	85,097.6	83.4	13.4	66.1	40.2
High Income Tot/Avg.	76,404.0	36,904.8	44.9	37.79	70.6	39.2
Americas	40,257.2	135,128.8	35.3	16.59	10.8	33.3
WORLD	90,719.8	491,342.5	52.6	8.22	70.2	35.2

Observations:

- Cellular/Mobile data for ECTEL countries is sketchy and, therefore, its use is limited for drawing conclusions.
- It is clear that the entry of Cellular/Mobil has been late in coming to the ECTEL countries, and that, across the board, the growth rate between 1995 and 1999 has been considerably less than the growth in countries of similar income levels (24-60 percent on a very small base, whereas the average growth rate for the Upper-Middle income level is nearly 85 percent for this same period). SKN's compound annual growth rate for 1995-1999 was not available.
- Teledensity of Cellular/Mobile as of 1999 is considerably less than countries with comparable income levels (teledensity of Cellular/Mobil of ECTEL being between 1 and 2 whereas the average for Lower-Middle is over 2, and for Upper-Middle income countries it is over 13). SKN's teledensity of Cellular/Mobile subscribers is 1.81.
- Cellular/Mobile as a percentage of the total teledensity is considerably less than averages for comparable countries (3-6.5 percent compared to 16-40 percent). This is due to a late start, but also likely influenced to some degree by the relatively high main line telephone teledensity. The total teledensity for Cellular/Mobile subscribers in SKN is 3.4 percent.

International Telephone Traffic – 1999

Country	Outgoing Telephone Traffic					International Circuits (000)
	Million Minutes		CAGR % 1995-1999	Minutes Per Inhabitant	Minutes Per Subscriber	
	1995	1999				
ECTEL Countries						
Dominica (U-M)	7.5	7.3	-0.8	94.8	340.1	0.4
Grenada (U-M)	7.8	10.3	7.4	110.5	350.7	0.6
St. Kitts/Nevis (U-M)	8.0	13.1	12.9	337.3	651.7	---
St. Lucia (U-M)	12.7	13.4	1.9	88.3	332.5	---
St. Vincent/Gr (L-M)	---	11.6	---	102.5	491.1	0.4
Barbados (U-M)	32.0	45.0	8.9	167.1	391.3	---
Jamaica (L-M)	62.0	70.1	3.1	27.4	137.5	---
Trinidad/Tobago (U-M)	58.6	67.8	3.7	53.5	243.2	1.9
Lower-Middle Income Total/Avg.	4,149.4	5,558.2	7.2	6.6	54.2	141.0
Upper-Middle Income Tot/Avg.	6,313.3	10,005.1	12.1	15.8	79.0	150.5
High Income Tot/Avg.	50,164.3	81,451.7	12.9	91.4	156.3	599.3
Americas	22,343.8	39,319.9	15.1	48.3	145.1	256.0
WORLD	63,416.6	100,805.4	12.2	17.2	111.4	1,014.8

NOTES:

Observations:

- The outgoing international traffic from the ECTEL islands on a per inhabitant basis is completely “off the charts” relative to comparable income level countries (88-333 minutes per inhabitant for ECTEL countries compared to an average for Upper-Middle income countries of 16). SKN’s outgoing international minutes per inhabitant topped the ECTEL countries at 337.3.
- On a per subscriber basis, this comparison is equally significant (333-652 minutes compared to 79 minutes for Upper-Middle income countries). SKN has 651.7 outgoing international minutes per subscriber – by far the highest of any ECTEL country.
- These disparities are most likely due to the nature of a tourist-based economy, but are also likely to be partially due to island Diaspora and family members living in the U.S., U.K., and Canada.
- The extremely high outgoing international traffic is a real “cash cow” for the incumbent telecommunications provider and will require serious attention during market liberalization.

Telecommunications Staff – 1999

Country	Telecommunications Staff			Main Lines per Employee		
	(000s)		CAGR % 1995-1999	1995	1999	CAGR % 1995-99
	1995	1999				
ECTEL Countries						
Dominica (U-M)	0.2	0.2	-7.2	81	130	12.7
Grenada (U-M)	0.3	0.3	-0.3	85	109	6.4
St. Kitts/Nevis (U-M)	0.2	0.2	-5.0	70	119	14.3
St. Lucia (U-M)	0.4	0.4	-0.9	79	107	10.7
St. Vincent/Gr (L-M)	0.2	0.2	-5.7	87	142	13.2
Barbados (U-M)	1.0	1.1	2.2	90	105	4.0
Jamaica (L-M)	4.3	3.2	-7.4	67	160	24.1
Trinidad/Tobago (U-M)	2.7	2.8	0.4	77	100	7.0
Lower-Middle Income Total/Avg.	1,112.1	1,114.7	0.1	68	92	7.9
Upper-Middle Income Tot/Avg.	642.9	700.9	2.2	139	179	6.5
High Income Tot/Avg.	2,359.5	2,550.5	2.0	195	2.4	1.2
Americas	1,316.9	1,574.1	4.6	168	172	0.6
WORLD	5,357.4	5,843.3	2.2	129	154	4.7

NOTES:

Observations:

- Across the ECTEL countries, it is quite clear that between 1995 to 1999, the current telecommunications provider (C&W) has been undergoing cost-reduction efforts, including dropping staff (0.3 – 7.2 reduction in staffing for this period).
- The number of main lines per telecommunications employee has naturally grown over this same period, but for the Upper-Middle income countries, ECTEL countries are still considerably below the world averages (107-130 lines per employee compared to an average of 179 for Upper-Middle income countries and a world average of 154). For St. Vincent/Grenadines, the comparison is favorable (142 compared to an average for Lower-Middle income countries of 92). SKN has 119 main lines per employee.

Telecommunications Revenue

Country	Telecommunication Revenue – 1999				
	Total (M US\$)	Per Inhabitant (US\$)	Per Main Line (US\$)	Per Employee (US\$)	As a % of GDP
ECTEL Countries					
Dominica (U-M)	13.4	175.0	628	81,650	5.1
Grenada (U-M)	---	---	---	---	---
St. Kitts/Nevis (U-M)	27.8	712.6	1,512	168,350	10.4
St. Lucia (U-M)	---	---	---	---	---
St. Vincent/Gr (L-M)	24.8	219.3	1,050	149,487	9.0
Barbados (U-M)	191.9	712.6	1,669	174,453	8.1
Jamaica (L-M)	462.6	180.7	908	145,066	6.6
Trinidad/Tobago (U-M)	226.9	175.6	814	81,679	3.1
Lower-Middle Income Total/Avg.	25,590.9	31.1	256	23,030	2.1
Upper-Middle Income Tot/Avg.	92,6045	145.9	733	138,086	2.9
High Income Tot/Avg.	682,740.4	766.1	1,310	268,690	2.7
Americas	344,154.7	427.8	1,276	220,233	2.8
WORLD	841,921.1	144.5	934	147,222	2.6

NOTES:

Observations:

- While information is sketchy for the ECTEL countries, on a per inhabitant basis, telecommunications revenue is considerably higher than the average for similar income countries (US\$219 compared to US\$31 for Lower-Middle income and US\$175-713 compared to US\$146 for Upper-Middle income countries). SKN tops the list at US\$712.6 telecommunications revenue per inhabitant.
- There is also considerably higher revenue for the ECTEL countries on a per line basis as well as a per employee basis (US\$628-1,512 compared to US\$733 for Upper-Middle income countries and US\$256 for Lower-Middle income countries). Again, SKN is highest at US\$1,512 telecommunications revenue per main line.
- Telecommunications revenue as a percentage of GDP is also very high for the ECTEL countries (5.1-10.4 percent compared to an average of 2.1 percent for Lower-Middle and 2.9 percent for Upper-Middle income countries). In SKN, telecommunications revenue accounts for 10.4 percent of GDP.

Telecommunications Investment

Country	Telecommunication Investment – 1999				
	Total (M US\$)	Per Inhabitant (US\$)	Per Main Line (US\$)	As % of Revenue	As a % of GFCF
ECTEL Countries					
Dominica (U-M)	---	---	---	---	---
Grenada (U-M)	---	---	---	---	---
St. Kitts/Nevis (U-M)	3.1	79.5	200	12.6	4.8
St. Lucia (U-M)	---	---	---	---	---
St. Vincent/Gr (L-M)	4.1	36.0	172	16.4	5.5
Barbados (U-M)	28.1	104.3	244	14.6	5.5
Jamaica (L-M)	135.8	53.0	266	29.4	6.6
Trinidad/Tobago (U-M)	69.7	54.3	264	32.8	4.5
Lower-Middle Income Total/Avg.	7,557.5	9.5	77	30.3	3.0
Upper-Middle Income Tot/Avg.	28,087.5	46.0	229	32.1	4.8
High Income Tot/Avg.	127,612.9	143.4	245	18.7	2.5
Americas	47,807.6	61.0	178	14.0	5.1
WORLD	188,486.6	33.0	210	22.6	2.9

NOTES:

- GFCF = Gross Fixed Capital Formation

Observations:

- The ITU report does not provide sufficient information on the ECTEL countries to detect much in the way of telecommunications investments other than to say it appears to be within the averages relative to population, but lower than average relative to telecommunications revenue.

Information Technology

Country	Internet - 1999				Estimated PCs	
	Hosts		Users		Total (000)	Per 100 Pop
	Total	Per 10K Pop	Total	Per 10K Pop		
ECTEL Countries						
Dominica (U-M)	181	23.66	2.0	261.44	5	6.54
Grenada (U-M)	3	0.32	2.5	267.70	11	11.78
St. Kitts/Nevis (U-M)	8	2.06	2.0	516.10	6	15.48
St. Lucia (U-M)	13	0.85	3.0	195.18	21	13.66
St. Vincent/Gr (L-M)	---	---	3.0	265.09	11	9.72
Barbados (U-M)	68	2.53	6.0	222.82	21	7.80
Jamaica (L-M)	367	1.43	60.0	234.35	110	4.30
Trinidad/Tobago (U-M)	4,852	37.54	30.0	232.14	70	5.42
Lower-Middle Income Total/Avg.	376,585	4.28	6,593.6	78.84	19,516	2.57
Upper-Middle Income Tot/Avg.	2,347,283	36.97	29,297.5	461.50	36,291	5.80
High Income Tot/Avg.	69,150,849	775.65	186,099.3	2,088.05	309,641	34.80
Americas	56,005,148	687.50	94,407.6	1,158.92	170,532	21.50
WORLD	72,005,852	120.46	235,449.42	398.44	389,890	6.84

NOTES:

Observations:

- Overall, the number of Internet hosts in the ECTEL countries is considerably below the averages for similar income countries. Dominica, while still under the average, is at least close (excluding Dominica, the range is .3-2 hosts per 10,000 population whereas the average for Upper-Middle income countries is 37; Dominica is 24). SKN has 2.06 hosts per 10,000 population.
- The number of Internet users in 1999 is very low, with 2,000-3,000 per country. The number of Internet users per 10,000 population ranges between 195-516 in ECTEL countries compared to the average for Upper-Middle income countries of 461; SKN has 516 users per 10,000 population.
- There is a high percentage of PCs per 100 population compared to other countries of similar income levels (6.5-15.5 per 100 population compared to 2.6 for Lower-Middle and 5.8 for Upper-Middle income countries). SKN is highest at 15.48 PCs per 100 population.
- The relatively high availability of PCs and the comparatively low use of the Internet is likely a direct result of limited access and costs (but mostly costs, since there are a high number of main lines per household across the ECTEL countries).

Network Growth

Country	New Telephone Lines Added (1998-1999)		New Mobil Subscribers Added (1998-1999)		New Internet Hosts Added (1998-1999)	
	Total (000)	CAGR %	Total (000)	CAGR %	Total (000)	CAGR %
ECTEL Countries						
Dominica (U-M)	1.3	6.3	---	---	---	22.3
Grenada (U-M)	1.9	7.1	0.6	42.7	35.8	41.4
St. Kitts/Nevis (U-M)	1.7	9.2	0.3	59.1	---	60.0
St. Lucia (U-M)	4.1	10.1	---	---	---	-43.5
St. Vincent/Gr (L-M)	2.6	12.3	0.7	89.3	---	---
Barbados (U-M)	2.0	1.7	18.0	150.0	---	54.5
Jamaica (L-M)	39.3	8.4	65.8	83.6	---	14.0
Trinidad/Tobago (U-M)	14.8	5.6	12.4	47.0	2.9	147.6
Lower-Middle Income Total/Avg.	6,729.7	7.0	8,453.7	75.6	17.4	5.0
Upper-Middle Income Tot/Avg.	10,883.9	9.4	39,033.5	84.9	1,078.1	84.9
High Income Tot/Avg.	13,213.6	2.6	102,211.4	43.6	27,283.8	65.2
Americas	11,686.4	4.5	38,894.7	40.5	23,905.9	74.5
WORLD	58,626.8	6.9	172,045.8	53.9	28,460.4	65.4

NOTES:

Observations:

- Growth in the number of main lines taking place between 1998-1999 in the ECTEL countries is close to the averages for similar income countries, with Dominica and Grenada being slightly less (Dominica's compound annual growth rate (CAGR) is 6.3, and SKN's is 9.2); the average for Upper-Middle income countries is 9.4.
- With the exception of St. Vincent/Grenadines, the growth in Cellular/Mobile for ECTEL countries is well below the growth rates for countries with comparable income levels (43-60 percent compared to 85 percent for Upper-Middle income countries; St. Vincent/Grenadines had an 89 percent growth in 1999 and SKN's was Grenada's growth rate was 59.1 percent).
- Growth in Internet hosts throughout the ECTEL countries is also well below comparable averages, but data is insufficient to make any additional observations.

St. Kitts and Nevis: ICT Assessment

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St. Kitts and Nevis: ICT Assessment

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